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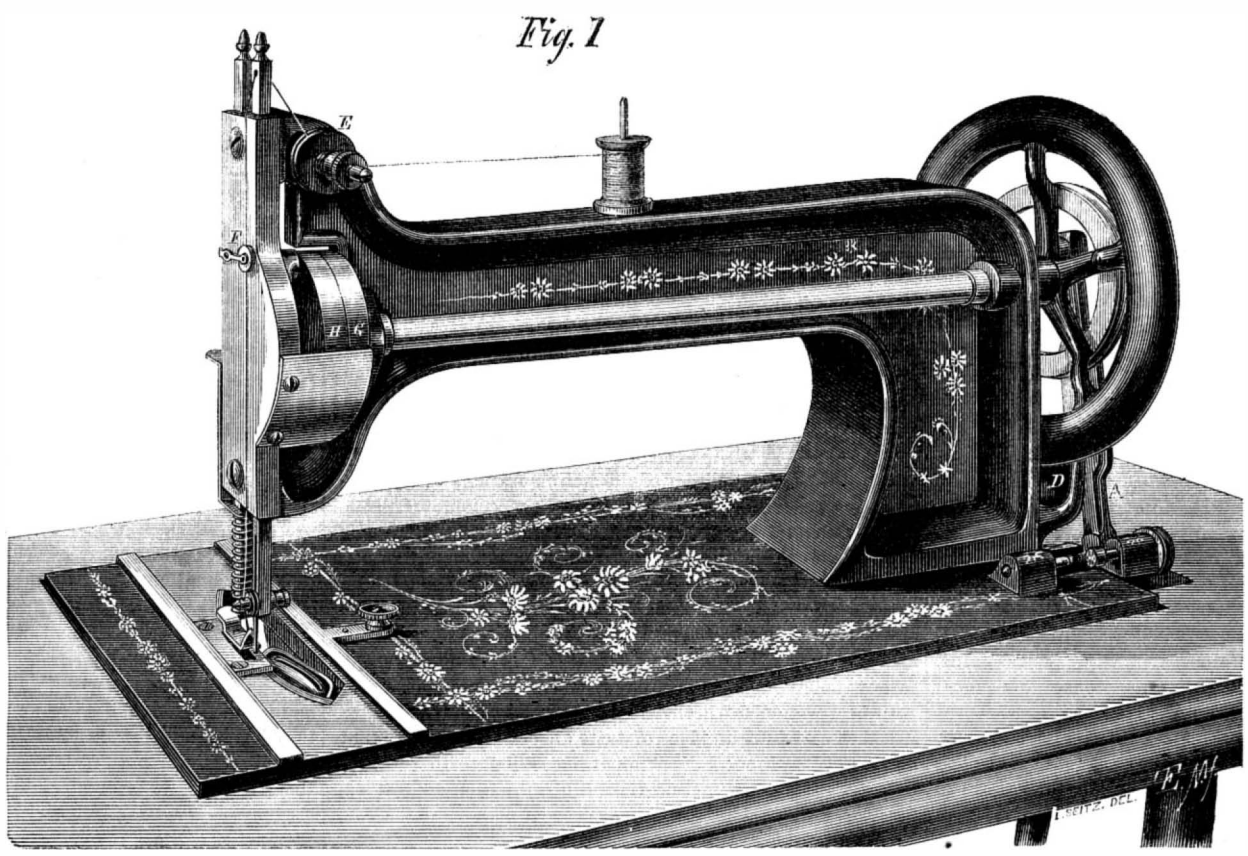
Improved Device for Actuating the Shuttle and Needle in Sewing Machines.

Some of the larger sewing machines are very noisy; the proper regulation of the thread tension is another difficulty not always overcome, and the loop in shuttle machines is often retained too short a time, so that occasionally the shuttle has not time to pass through it and a stitch is dropped. To remedy these defects is the object of the improvement illustrated in the accompanying engravings. Fig. 1 is a perspective view of the Grover and Baker improved machine for sewing heavy goods; Fig. 2 is a view of the under side of the table at the wheel end, and Fig. 3 a similar view of the other end.

The first improvement is the means of connecting the driven pulley on the upper shaft, which drives the needle bar, with the lower, which drives the shuttle lever. This connection is made by a bar, A, Figs. 1 and 2, the upper end of which is strapped to a pin, B, Fig. 2, on the driven wheel which pin may be considered the wrist of a crank. The other end of the bar turns on a stud forming a part of a block that slides in a T-shaped groove in a flange, C, Fig. 2 secured to the lower, shaft. Between these two points, however, is a fixed stud or arm, D, Figs, 1 and 2 with a screw on which plays the bar, A, by means of a longitudinal slot. Thus the connection between the two shafts is made without the employment of intermediate gears or cranks, producing a noiseless motion with diminished friction.

Fig. 1



GROVER & BAKER'S IMPROVED SHUTTLE SEWING MACHINE.

The next improvement is the manner of equalizing the tension of the thread. For this purpose a pair of circular plates or disks, E, Fig. 1, are placed upon a horizontal stud. Between these the thread for the needle passes, and they are graduated in their contact by a thumb nut and spiral spring, as seen. To take up, or rather to retain the slack of the thread caused by the upward movement of the needle bar, a similar pair of disks are placed on the needle bar plate, as at F, Fig. 1, held together by a flat spring and opened by a prominence on the needle bar, which, as it passes, throws the outer one from the inner and permits the thread to escape.

Fig. 2

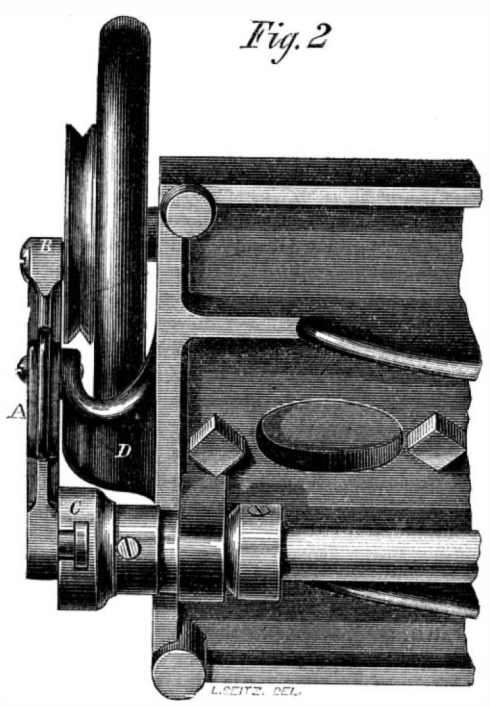
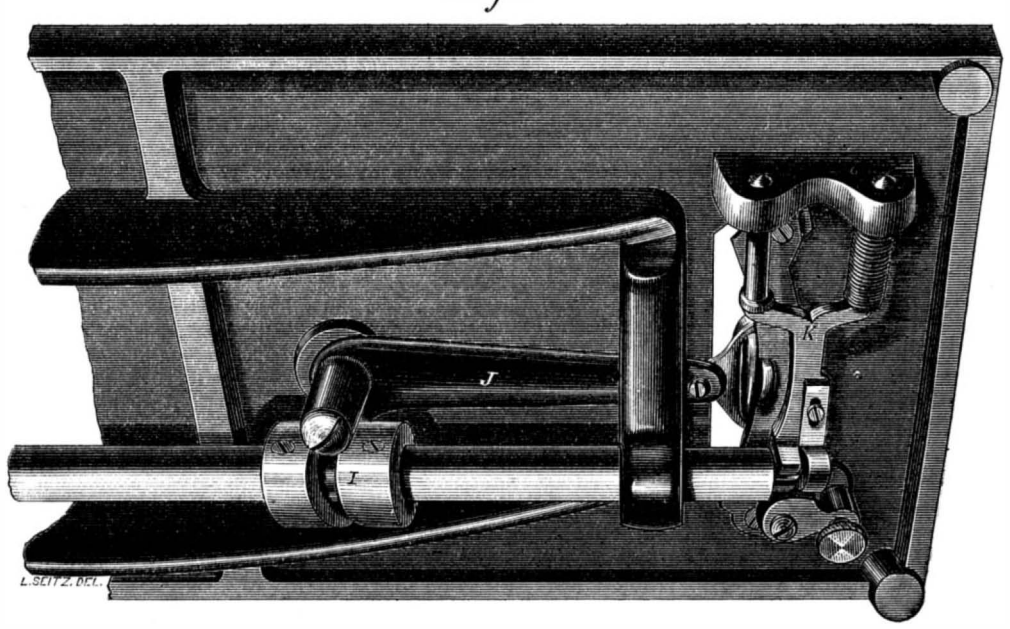


Fig. 3



Those who use sewing machines cannot fail to perceive the advantages of these simple tension devices.

The third, and possibly most important improvement, is the method of giving motion to the needle bar and the peculiarity of that motion. The object is to allow plenty of time for the passage of the shuttle through the thread loop, and this is assured by a very simple device. On Fig. 1 is seen a disk, G, which is secured firmly to the frame that supports the needle bar and the upper shaft; it does not turn. On its face is cut a cam groove in a form approaching an oval. Just outside of this disk is another, H, of the same diameter, which is fastened to the shaft and rotates with it. Through this is cut a radial slot, through which passes a stud attached to the needle bar, and on that stud is a steel roller that traverses the oval slot in a fixed disk. Now, the result is that the motion of the needle bar is governed solely by the direction or form of that slot. The arrangement is such that while the shuttle is being passed from one side to the other the needle bar, and consequently the needle, itself, is stationary, and the loop is left intact until the shuttle has passed through, when the needle moves rapidly up or down. With this device it is not possible that the thread should engage with the shuttle in its passage, and, consequently there can be nc slipped stitches. Such an advantage as this cannot escape the notice of those who use sewing machines in their daily work.

Fig. 3 shows the cam, I, which gives motion to the shuttle bar, J. This moves the shuttle in a race which is the segment of a circle of which the shuttle bar is the radius. The movement of the shuttle is, of course, positive, as in other machines. The lower shaft on which the cam, I, is secured gives motion to the feed, K.

For heavy work, especially, these devices are well adapted. They diminish the noise of the machine, distribute friction, and prevent undue wear of the sewing thread. All these points of improvement are sufficiently evident by an observation of the engravings.

Further information, and an opportunity of witnessing the operation, as well as of comparing the improved machines with others, may be obtained by a visit to the depot of Grover & Baker's sewing machines at 495, Broadway, New York city, or by addressing as above.

Autumnal Diseases.

These are chiefly diarrhea, dysentery, and various grades of fevers, from slight "creeps" to congestive chills, for fever is the reaction of coldness, but when there is not power enough in the system to react from the cold stage, death is certain, as in congestive chill, in which the blood becomes so cold, so thick, and so impure that it ceases to circulate, becomes stagnate, and the machinery of life stops forever. Hundreds of thousands die every autumn of the three forms of disease mentioned, but not one need die, they are avoidable diseases, their causes being known and all that is required is to bring a very moderate amount of intelligence to bear in avoiding those causes. A baby will avoid putting its finger in the candle a second time; it remains only to grown-up stupids to expose themselves to the causes of disease year after year and thus recklessly imperil health and even life itself.

The cause of autumnal diseases is an emanation from the surface of the earth in those localities where are found in combination heat, moisture, and vegetable matter, such as leaves, wood, etc., for the heat of eighty degrees combined with moisture induces decay, and from this decaying substance something arises which, if breathed or otherwise taken into the system, induces the disease mentioned sooner or later.

What this emanation is, has hitherto been merely a conjecture, because it was impalpable, so like thin air, that the atmosphere which contained it when subjected to chemical analysis yielded nothing beyond the constituents of pure air. But within a year or two it has been ascertained that if a quantity of air of a miasmatic locality is bottled up and is conveyed to a sleeping apartment, the person who breathes it will, in a short time, have more or less decided symptoms of fever and ague; and on examining his saliva or the inside of his mouth a living, moving thing is clearly visible with microscopic aid. Observation and experiment have shown incontrovertibly that there are two ways of escaping the ill effects of having these living things introduced in the system,

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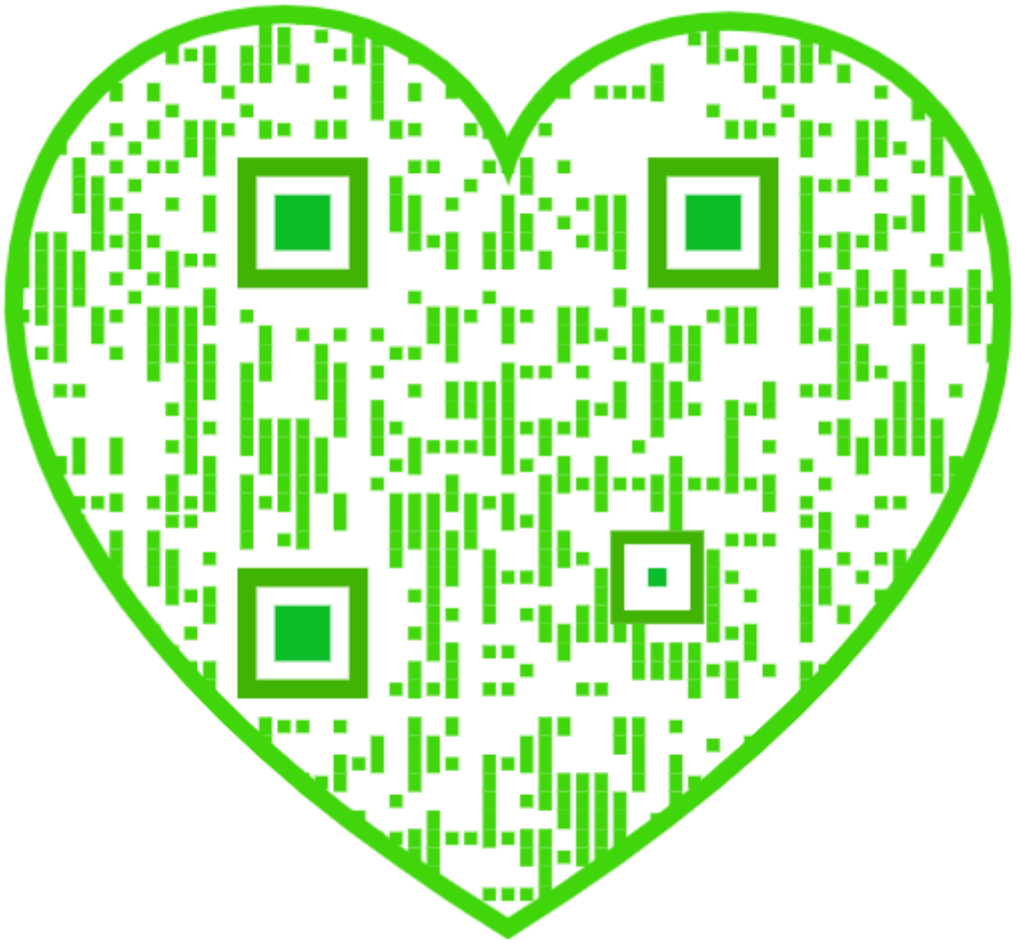

persons must avoid living in localities where the land is rich, flat and moist, or they must drain those lands; but it is possible to live in such places, and have reasonably good health simply by keeping in the house of mornings, with a brisk blazing fire until breakfast is eaten, and take supper at sundown, because it has been found that these emanations are more poisonous at sunrise and sunset and that if the stomach is excited to action by the process of digestion the emanation is rendered innocuous, perhaps from the fact, in part, that the juices of the stomach at the time of digestion are of a character to destroy the life of these living things; but the fact remains the same, whether this supposition is true or not.

A practical use may be made of this subject in the light of these facts, in reference to breathing night air. Very many advocate the raising of windows in a sleeping apartment summer and winter all the year round; the theory seems a good one, but experience will not corroberate it. Persons living on water courses where the "bottom lands," as they are called, are rich, luxuriant, and damp will save health and life itself by keeping all outside doors and windows opening into chambers closed from sundown to sunrise during the three autumnal months, in fever and ague or intermittent localities.—*Hall's Journal of Health.*

Special correspondence of the Scientific American.

THE EXPOSITION.

A GERMAN PAPER MILL.

In an annex of the kingdom of Würtemburg is erected and kept in operation for a number of hours each day, a train of machinery for the manufacture of paper from wood. The finished paper indeed is not made here, but the wood is thoroughly reduced to pulp, ready for the production of paper in the ordinary manner. The process as here carried on is as follows: The wood, which appears to be quite green, is sawed into lengths of twelve or fourteen inches, by a circular saw. A man with a drawing knife then strips off the bark, and in this state, the round wood being already split into two or three pieces, it is introduced into the grinder. The face of this is the same in width as the length of the pieces of wood; and these are laid across it and held against the revolving face by screw clamps. The speed of revolution is about 100 turns per minute, with a diameter of about three or four feet. The screws that press the blocks of wood against the face of the grinder are each provided with a nut worked by a worm, for the purpose of slowly feeding up and maintaining the pressure as the wood is worn away. These worms are all driven by a belt passing over the pulleys on the ends of their shafts, and to allow for irregularities in the hardness of the wood, the connection between the pulleys and the worm shaft is made by a reversed ratchet, the pawl being held against the teeth of the ratchet by a short and stout india-rubber band attached to a pin on the side of the pulley. If the pressure required to screw up the nut increases beyond a certain limit, the pawl will slip upon the teeth of the ratchet, stretching the india-rubber band and fail to screw up until the resistance becomes reduced. A current of water is kept passing over with the grinder, and the ground wood passes off with this to a revolving drum of coarse wire gauze placed on a lower level and some little distance in advance of the former apparatus. The drum is furnished with an automatic comb, which removes from its surface and throws into a receptacle in front of the drum all coarse pieces of wood or chips that may have been formed, while all the true pulp, even though quite coarse, passes through the meshes of the wire drum and out at one side into a receiving tank provided for it. It does not remain here, however, but flows immediately through a four-inch, or thereabout, copper pipe into another grinder of a conical form, revolving about a vertical shaft, and then again passes to a tank containing a revolving cylinder similar to the first, but of a finer mesh, where it is still more finely strained, and this process is repeated yet once or twice more, so that pulp of several degrees of fineness is obtained, the water at last flowing off nearly clear and returning to be pumped back to the first portion of the apparatus, or running to waste, as the case may be. The pulp, as collected in the last tanks, is quite uniform in substance, and seems to possess considerable fiber and tenacity. The paper manufactured in this way appears to be of excellent quality, and if a certain proportion of cotton pulp is mixed with it, it may be used for almost all the usual purposes of paper made from cloth.

Within the past month most of the buildings in the park, as well as the streets around it, have been completed, and there is not now so much of that unfinished appearance which detracted considerably from the general effect during the first months of the great Exposition.

SCHOOL HOUSE AND COTTAGE.

The United States have added several creditable structures in the grounds, such for instance as a primary free school-house, containing the usual furniture and apparatus of such an institution; in reference to which we can also say that no attempt has been made to produce display by introducing things not in actual use. It looks serviceable and practical. Then we have a portable farm cottage from Louisiana, which is rather more pretentious, having a Grecian pediment and columns before the door.

HOT-AIR ENGINES.

More important than this is a building or roof, under which is placed Mr. Shaw's hot-air engine. This has been in course of erection ever since last March, but from bad workmanship has given a great deal of trouble in getting to work. At last, however, it is in operation, and appears to work with a will. This is a machine which theoretically is important, while the practical difficulties, which have always been the chief ones to overcome in this class of engines, appear to have been pretty effectually surmounted. As has been often proposed before, the whole of the products of combustion are applied directly to the piston to produce motion, thereby utilizing a greater proportion of the heat than is possible when these are only used to raise a separate volume of air to an equal temperature with themselves. If the products of combustion are then allowed to escape, and only the air which they have heated used, it is evident that perhaps half the heat is thrown away bodily, unless a very large body of air is raised to a low temperature and worked at a very low pressure. The great difficulty in the way of using the hot gases from the fire directly in the cylinder has been the apparent impossibility of preventing the surfaces from cutting, by the combined action of the heat and dirt. Mr. Shaw seems to have obviated this by attaching to his pistons a drum of a diameter very slightly—say one eighth of an inch—less than that of the cylinder, and a length equal to the stroke, and providing an arrangement by which before each stroke the annular space between the drum and the cylinder is filled with cold and clean air of the same pressure as that which comes upon it afterward. Having no way of escape, this air remains in the space during the stroke and protects the working faces from injury by preventing the hot and dirty gases from impinging at all upon them. As a further and very important means of economy, regenerating surfaces of iron and brick are provided, for abstracting as much as possible of the heat remaining in the exhaust air, and imparting it to the incoming cold air. A trial was had lately with this engine, which showed an economy of coal superior to what has been obtained with the steam engine, and as this is yet in its infancy, we shall no doubt hear much more of it in future.

GLASS WARE AND PLATE.

But as it is raining, let us go in and take a walk through the passages of the main building. Truly the magnificence of the French department surpasses the power of description, and casts all others quite into the shade. The central portion, or the straight piece connecting the two circular portions, at the ends, is devoted to the display of bronzes, tapestry, glass, porcelain, and gold and silver plate, and without question such a display of elegance and taste was never before to be seen under any circumstances. One is almost bewildered by the brilliancy of the glass ware, and stopping to examine it he is charmed with the beauty of the forms into which it is fashioned, and the delicacy of the ornamentation. Among the plate is a service made for M. Petin, of the celebrated firm of Petin, Gaudet & Co., ornamented with appropriate representations of the machinery employed in the manufacture of iron and steel, arranged in groups at the corners and other prominent points. In another case is a set of gold vases enameled in various colors with beautiful devices, in such a way as entirely to hide the precious metal, and thus presenting rather the appearance of finely painted porcelain It may well be questioned whether in any palace in Europe there exists such an exquisite piece of taste and workmanship. This portion of the French department has called forth the most unbounded admiration from visitors of all nations, and it well deserves to have done so.

SCIENTIFIC APPARATUS.

Returning again to objects of a more practical nature, we notice the fine collection of scientific apparatus which the French makers exhibit. They have, as we know, always been celebrated for their proficiency in this branch of manufacture, and their reputation is here well sustained. A very good collection of air pumps is exhibited, presenting some features worthy of notice. The pistons are made in length say twice the diameter of the cylinder, and are simply of brass with a number of small grooves turned on their face, a system now sometimes used as a substitute for packing in the pistons of small steam engines. A very neat substitute for a parallel motion, or means of converting the motion of the crank into that of the piston rod, is adopted in these pumps, and quite frequently in other French machines. It consists of a fixed internal gear placed concentrically with the crank shaft, and within this another gear of just half the diameter on the pitch line, secured to the crank and revolving with it.

Firmly fastened to this is an arm carrying a pin in such a position that when the crank is horizontal or at half stroke, this shall be exactly opposite the center of the internal gear. As the small gear goes around the inner circumference of the former, it will be seen that this pin which moves the piston rod will travel in a straight vertical line, while the construction of the motion is extremely simple.

TRACTION ENGINES AND AGRICULTURAL MACHINERY.

A portion of the park is devoted to traction engines of various descriptions and the machines there exhibited are of interest as showing the progress that has been made in the application of steam. The importance of steam power for agricultural purposes is becoming more fully appreciated now in Europe as the very large number of portable engines adapted to this end, which have been sent to the Exposition, clearly shows. The traction engines are chiefly intended for the same use, the gearing being so arranged that in addition to the ordinary functions of portable farm engines they may be used as locomotives in drawing wagons. The examples exhibited illustrate admirably the practice of the different makers, and perhaps in no class of machinery in the Exposition are the distinctive characteristics of French and English design more strikingly shown.

Messrs. John Fowler & Co., of Leeds, who are among the most prominent makers of agricultural machinery in England, send a traction engine of simple and substantial construction. The power is furnished by a pair of horizontal cylinders, and the gearing, though such as to permit of the pistons working at a tolerably high speed, consists of but few wheels, and these have teeth of good size, being in fact if anything too heavy. The driving wheels receive their motion from a large gear wheel running on the same shaft and placed just inside of the former, a friction clutch being employed to throw them in or out of gear. The machine is steered by a chain passing around a pitch pinion and taking hold of the forward axle on each side of the center. The pinion is moved by a worm gear on the upper end of its shaft. Messrs. Aveling & Porter also have an engine which has proved its capabilities for work by drawing five loaded wagons weighing 35 tuns up a slight grade. In this engine a single horizontal cylinder is employed, and the motion is so reduced by gearing as to enable this to supply all the power required, while from the high speed so necessitated no trouble from working over the centers is experienced. The motion is imparted to the driving wheels by a pitch chain passing over a pinion in connection with the gearing, and a large pitch wheel turning on the same shaft with the driving wheels. A stout pin is used to clutch the chain wheel to the drivers, and by withdrawing this the engine is free to work while remaining at rest, while if one pin only be withdrawn the engine is enabled to turn easily around a short corner. The steering is effected by a single knife edged wheel in front, which supports merely enough weight to give it a proper bite on the ground without imbedding it too deeply.

A third engine which stands by the side of those already mentioned is of French construction being built by Messrs. Lotz, Fils ainé, of Nantes. It presents a marked difference in design and workmanship to the English engines. It is intended to be used as a plowing engine as well as for traction, and this of course gives rise to some of its peculiarities, but like many Continental machines it is full of light rattle traps which are never so much out of place as in an engine for rough use like an agricultural one. A pair of vertical cylinders are employed, the crank shaft pillow blocks being secured in an extension of the fire box casing. The driving wheels are moved by a pitch chain as in the last mentioned engine, and more than one diameter of pitch wheel is provided so that the speed and tractive force of the engine can be varied. All the gearing, however, appears light and inferior. The barrel of the boiler is encircled by two drums for winding in or out the wire rope by which the plows are to be drawn. These bear, through the intervention of rollers, on an inner ring or seat fastened to the shell of the boiler, and are driven by gearing at their circumference. An over ingenious moving guide is provided to lead the wire rope on the drum in such a manner that it shall not over-ride itself, the motion resembles that used in some slotting drills for traversing the tool back and forth. A longitudinal shaft runs along the top of the boiler to convey motion from the engine gearing to the drums.

The same makers exhibit a traction engine with a single vertical cylinder working a pinion shaft from which motion is communicated to the driving wheels by a pitch chain. It is steered by a single wheel in front. Notwithstanding the manifest inferiority in design of these engines to the English, they have received a medal of a much higher class than the latter! There is nothing from America in this line; indeed, though there is a large demand for portable engines with us there appears to have been but little done as yet with traction or plowing engines.

The display of farming implements in general is very good. That in the English department is much the most complete, but this, as compared with what we might have shown, is due in part to their greater proximity to Paris, since the tools that are to be seen in the American annex are not lacking in merit, while it is easy to recognize an American model in very many of the machines in the English department. As a rule the French tools are inferior in design and workmanship to either the English or American. As already stated in a previous letter the grand prize in this class has been awarded to Messrs. Howard, of Bedford, England. Their system of steam plowing is represented by a model in the British annex, but their full size apparatus is at Billancourt, one of the suburbs of Paris, where are grounds more suitable to such an exhibition. Messrs. Fowler also have a fine display of similar machinery.

Messrs. Ransomes & Sims, of Ipswich, also large manufacturers of agricultural machinery exhibit among other things a very useful arrangement of thrashing machine in combination with apparatus for cutting up the straw for fodder for animals in countries such as Spain, Turkey, Mexico, etc., where grass is not grown for hay. The straw which is raised in these countries, is quite thick and nutritive, and if it be cut with an ordinary hay cutting machine, thus leaving the edges strong and sharp, the palates of the animals are so injured by the passage of the rough food over them that they absolutely refuse that kind of fodder. It is necessary, therefore, to bruise the straw so as to destroy its stiffness in order that it may be of any use. In this machine the straw is passed into the box containing two rollers fitted with knives and lugs which pass between pairs of similar ones on the side of the casing; these run at a high speed and from the rapid motion and peculiar shape of the cutters the straw leaves the machine thoroughly bruised and prepared for the cattle.

In the French and Belgic grounds are exhibited model barns and barnyards showing various approved plans of stalling cattle, sheep, etc., and the opportunity is also taken to exhibit specimens of choice breeds of stock. Fresh milk and sandwiches are served out to those who are fond of such plain fare in the little restaurants adjoining.

The awards of medals in this department has been such as to devide the honors pretty equally between the principal nations, Wood and McCormick receiving gold medals in the United States, and about the same number being awarded to French and English exhibitors. The Americans have always shown the greatest aptitude for this class of work, and the greatest originality in invention, but they have not carried

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it quite so far in all directions as has been done in England.

The Emperor of Russia obtained a grand prize for efforts to improve the equine race, exemplification of what he had done being given by a splendid lot of horses, which are exhibited at certain hours in the day in an enclosure in front of their stables, which are very complete in arrangement. The English have also several exhibitions of stalls showing modes of drainage, feeding, watering, and ventilation, besides many other details of minor importance but which tend to give a look of neatness and comfort to a stable, and which have a real utility beyond mere appearance. SLADE.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The sixteenth annual meeting of this association, held this year in Burlington, Vt., was brought to a close on Monday, Aug. 26th. This society is a much more democratic body than its younger branch, the Academy of Science, whose meeting at Hartford we noticed two weeks ago, no limit being enforced upon its number of members, any person sufficiently interested in the progress of science to contribute the small annual fee being eligible for membership. The association had its origin in a convention of geologists at Philadelphia in 1840, when an organization was effected under the name of the Association of American Geologists and Naturalists. Its sphere was subsequently enlarged and the present title selected, the first meeting being held in 1848. The objects of the association, as set forth in its constitution, are to promote intercourse between those who are cultivating science in different parts of the United States, to give a stronger impulse to scientific research, and to procure for the labors of scientific men increased facilities and wider usefulness. There are now over five hundred names upon the roll of membership, but less than one fifth of this number were present at any one of these meetings.

The afternoon session of the first day was opened by Prof. Lovering, who exhibited an apparatus for making sound visible. By a suitable arrangement, the air pulsations caused by a sounding organ pipe are communicated to a burning gas jet, producing corresponding vibrations of the flame. A revolving mirror is employed to make these vibrations visible to the eye. By this arrangement the relative velocities of different classes of vibrations given by theory were verified. A singular result was noticed when two pipes of precisely the same pitch were placed side by side; they tended to silence each other, the vibration of the one rising while falling in the other. Prof. Newcomb read the second paper, on a "new determination of the distance of the sun," the calculations having been made at the Washington Observatory. Ten years since astronomers began to suspect that the value of the sun's distance found by Encke from the transits of Venus observed in 1761 and 1769, was largely in error. This distance, 95,300,000 miles, had long been received as the standard. But all the modern tests which could be applied to it indicated that it was about three millions of miles too great. In the year 1862 circulars were issued independently from the observatories of Washington and Pulkowa, (the Russian national observatory situated near St. Petersburg,) inviting the coöperation of astronomers everywhere in a general attempt to determine the parallax of Mars at apposition of that year. The plan was generally adopted, and nearly every active observatory in the world engaged in the observations, which occupied ten weeks. It was the most extended coöperate effort on the part of astronomers which had been made during the century.

Through the pressure of other duties and the illness of the astronomer who had proposed the work, the Pulkowa observatory had not been able to undertake the discussion of this great mass of observations, so that for five years their result remained unknown. Last winter an arrangement was made between the observatories at Washington and Pulkowa, by which this discussion was placed in possession of the speaker, to be executed and published by authority of the Naval Observatory. It is now complete, and the sun's distance is determined to be 92,340,000 miles, and the velocity of light is thus reduced to 185,500 miles per second.

Prof. C. S. Lyman, of Yale College, exhibited a new apparatus for illustrating the motion of the waves of the ocean. Mr. Roosevelt followed with a paper on the distribution of the precious metals in the United States, and Prof. E. N. Horsford closed with an essay on the subject of bread, which is an old hobby of his.

"The Relative Value of Gold and Silver for a Series of Years" was the theme of the opening paper of the second day's meeting, by Mr. E. B. Elliott. It seems that in 1700 the average market value of gold was 15·5 times that of silver. In 1841–1848, the average was 15·8; in 1849–1852, 15·5; and since 1852 it has averaged, at first 15·33, and later 15·4. It is now about the latter figure, quite persistent, and tending rather in favor of gold, by the increasing production of silver. The production of the latter in the world is on the increase, and the present value of the metals is not likely to be reversed or particularly changed, except in favor of the higher price of gold. Prof. Hall followed and repeated the remarks concerning the Cohoes mastodon, made by him at the late Hartford meeting, but which then caused a spirited discussion. Both conclusions, as to the age of the mastodon and those relating to the glacial action in the distribution of the bones, being disputed, Prof. Dawson, of Montreal, declared himself a disbeliever in the American glacial theory; other eminent geologists held the same opinion, and the mastodon was in turn referred to several ages before, after, and during the glacial periods. At this point of the proceedings the members were divided into the two sections of (A) mathematics and physics, and (B) natural history and geology.

The papers read at this first session of section A were of such a character that no report such as our limited space will permit, would do justice to them. The subjects and their authors were the following: 1. Remarks on meteorological results deduced from the new method of registration; G. W. Hough. 2. Remarks on the laws of winds; Prof. J. B. Coffin, of Lafayette College. 3. On the periodicity of the aurora; Prof. Lovering. 4. Occupations of the people classified; E. B. Elliott, the eminent statistician. 5. On the determination of latitude from observations in the prime vertical; W. A. Rogers; 6. On new diagrams and derivation symbols, illustrating the prominent characteristics of chemical elements; Prof. S. D. Tillman.

In section B: 1. "The study of the orthoptera of North America" was treated by L. H. Scudder, of Boston. 2. "Traces of ancient glaciers in the White Mountains," by G. L. Vose. The speaker found glacial scratches 5,350 feet above the sea on Mount Washington, and he considered this peak as the center of the glacial system. 3. Prof. Marsh read a paper on the "Origin of lignilites or epsomites." 4. Prof. Hall explained the "Geographical distribution of fossils in the Hamilton, Portage, and Chemung groups." 5. Mr. L. E Chittenden interested the audience with an account of a species of shell, the *Lininea megasoma*, found only in lakes Huron and Champlain, and rapidly disappearing even there.

At the general session on the third day, Dr. Gould read a paper on the "Velocity of transmission of signals by the telegraph." Previous to the year 1849, it was supposed that the velocity of electricity through wires was too great to be measured. In that year, Sears C. Walker discovered, while measuring longitude, a perceptible retardation. Between Washington and St. Louis the velocity was found to be only 15,000 miles per second. On the submarine cable between Greenwich and Brussels the velocity was only 8,000 or 9,000 miles. On the Atlantic cable, Prof. Gould found the velocity to be between 7,000 and 8,000 miles per second, being greatest when the circuit was made by the two cables. Incidentally it was shown that the usual practice of telegraphers to increase the power of their batteries is entirely unnecessary and unwise. A single element is sufficient to produce the signal through 4,100 miles of the cable. The speaker mentioned the fact that he had transmitted signals from Valentia to Newfoundland with a battery composed of a percussion cap, a drop of acid, and a morsel of zinc, and had also transmitted signals on wires from which the battery had been removed, by the previous charge alone. The insulation of the cables improved by time, and signals were sent most rapidly by alternating positive and negative currents.

The second speaker was Prof. Horsford, who lectured on the structure of ice, in relation to the sudden disappearance of ice on Lake Champlain. This ended the scientific exercises of the general session, the other papers being referred to their appropriate sections.

In section A, Prof. Hungerford read a paper relative to experiments with snow at a temperature below 32°. He attempted to show that snow could be then changed directly into ice, by simple pressure. He was followed by Prof. Hough in an abstruse paper on "Personal equation in transit observations." Dr. Bradley claimed "Tellurium as a metal." His reasons for this classification have previously appeared in these columns. Prof. Tillman next presented his "Method of representing musical intervals upon a spiral projection." The exercises in this section closed with Prof. Hyatt's paper on the "Value of wood spirit for practical purposes." In section B, Prof. Newberry exhibited portions of a fossil fish from Devonian rocks in Delaware, Ohio, remarkable for its size, it being probably not less than twenty-five feet long. The second paper was by Mr. Scudder, of Boston, on fossil insects of North America. Prof. Hitchcock read a paper on Winooski marbles at Colchester, Vt. Prof. Verrill, of Yale College, on zoological affinities of tabulated corals. Prof. Worthen followed with a paper on the coal measures of Illinois. Prof. Dawson read the last paper, on new points in geology in Nova Scotia and New Brunswick.

At the general session on Monday, after the passage of resolutions tendering thanks of the association to George Peabody for his donations in behalf of science, the society proclaimed itself as cordially in favor of the introduction of the metric system of weights and measures, but opposed to change the weight of the existing monetary unit, the gold dollar.

In the sectional meetings papers were read on the geology of the state of Maine, and another on the geographical distribution of radiates on the western coast of North America. "Climate glacial epoch in North America," also a paper on the "Ripton sea beaches," both by Prof. Hungerford; "Geology of Vermont," by Prof. Hitchcock; and "Ichthyological fauna in Lake Champlain," by Mr. Putnam.

After some business transactions, the session was declared adjourned, to meet next year in Chicago.

The Late Obed Hussey.

In the annexed history, from the *Ohio Farmer*, we regret to notice the absence of the name of a citizen of Maryland, says the *Turf, Field and Farm*, to whom, undoubtedly, belongs the credit of having invented, and brought into practical use, the first reaper and mower ever seen upon this continent. We allude to the late Obed Hussey, of Baltimore. We remember, when quite a young man, the interest with which we watched him, hour after hour, toiling upon the rude materials, which, at the bidding of his genius, were soon to be fashioned into the machine, which has done so much to lessen the toil of the farmer and cheapen the food of mankind. We remember his many heart breaking discouragements, and the brave perseverance with which he encountered and overcame them. We remember, too, rejoicing with him at the first successful trial of his mower, made on the estate of the late Gustavus Weems, in Annie Arundel Co., near Herring Bay. If we are not mistaken, the heirs of Hussey are now reaping, in the shape of a royalty on part of his invention, the reward which he, unfortunately did not live to enjoy.

Most people take it for granted that reapers and mowers are quite of modern invention, but such a conclusion is far from being correct. Others have supposed that some American Yankee first conceived the idea of constructing a machine for cutting grain with horses or oxen; but history informs us that reapers were in operation before Columbus discovered the Western Continent, and that the sickle and the scythe, in some of the oriental countries, had been superseded by reapers that were worked by one or two oxen, in the early part of the Christian era.

The first account of a machine to reap grain appears to be that given by Pliny the Elder, who was born, it has been supposed, about the year of our Lord 23—more than 1800 years ago. This historian says:—"There are various methods of reaping grain. In the extensive fields of the lowlands of Gaul, vans of a large size, with projecting teeth on the forward edge, are driven on two wheels through the standing corn (oats and barley are called corn) by an ox yoked in a reverse position—with the machine forward of the ox. In this manner the ears (or what we call heads of barley or panicles of oats) are torn off and fall into the van. In some places the stalks are severed in the middle by sickles, and the ears, or heads of grain, are stripped off between two hatchels."—Palladius. an Eastern ecclesiastical writer, gives the following account of reapers in A. D. 391. In the Gallic lowlands they employ a more expeditious method of reaping, requiring the assistance of a single ox during the whole of harvest time. A cart is constructed which moves on two wheels. A low box of boards is constructed on the wheels, and the boards in front are lower than the rest. Behind this cart two shafts (or thills) are fastened, like the poles of a sedan chair. To these an ox is yoked and harnessed, with his head turned towards the cart; and the ears, or heads, are gathered in the box, and the driver regulates the elevation and depression of the teeth with a lever."

The next account of a reaper is given in proposals, submitted in Britain in 1785, for constructing a reaper. This machine was propelled by a horse or ox, clipping the heads of grain and depositing them in a large box, which was emptied when it was full into a store room. In the details of this machine, a drive wheel, pulleys, pinions, tooth wheels, and iron combs, or teeth, are spoken of.

In 1799 another reaper is spoken of as being propelled by a horse behind it, which cut and laid the grain in a swath, on one side of the reaper. A boy could manage the machine, and with one horse could cut a swath about two feet wide, or rather more than could be reaped in the same time by six men with sickles.

In 1806 Mr. Gladstone produced a reaper for cutting grain, delivering the straw into gavels to be bound. Drive wheels, pulleys, bands, etc., are alluded to in the details of this reaper.

In 1807 Mr. Pluckenett constructed a machine in which a horse drew the machine instead of pushing it forward, according to the usual custom of operating reapers. After this period many inventors entered the field with reapers of an improved construction, and in 1823, Mr. Mann, under the auspices of the Highland Society of Scotland, brought forward a new reaper, which was worked with one horse and which could reap 10 acres in 10 hours.

In 1830 a mowing machine was produced, and soon after that a combined reaper and mower is spoken of. After that time the celebrated McCormick reaper entered the field, astounding Americans as well as farmers of the Old World.

The Petroleum Fuel Mania.

A successful experiment was made last week on the Ohio River with petroleum as a substitute for coal in navigation. The *Cincinnati Gazette* says of the new method of raising steam: "The advantages of this arrangement are so obvious that it seems almost superfluous to speak of them, yet we cannot resist pointing out a few of them. First, we have the economy of the fuel itself, $20 worth of petroleum being equal to $50 worth of coal. Then, there is the economy of weight and space, which is as one to ten. In addition to this we have the saving of wages of firemen and coal-heavers, the saving of time in taking the fuel on board, and above all, the perfect control of the engineer over the fire, and complete absence of danger from sparks. The explosive qualities of petroleum have hitherto been the great bugbear by which our enterprising steamboat builders and machinists have been scared off. We are not at all surprised at this, for steam itself had to struggle hard ere it could assert its supremacy over every other power in use, and we feel satisfied that coal will give way to petroleum as the tow path gave way to the railway."

The above is an excellent sample of the rubbish concerning the use of petroleum for fuel, which has been circulatlng in newspapers for the past few months.

GERMAN MOURNING CANDLES.—These are made by heating paraffine with the shells of the Anacardium nut, which contains a black resin soluble in paraffine. While the paraffine is liquid it is of a dark brown color, but on solidifying it becomes jet black. The candles have a very thin wick and burn without giving off any unpleasant odor or vapor. Who will invent some combination of chemical substances to incorporate into sterine or wax candles which will give a variety of colors when burning, say red, green, or yellow. The demand for such an article would be very great for illuminating purposes.

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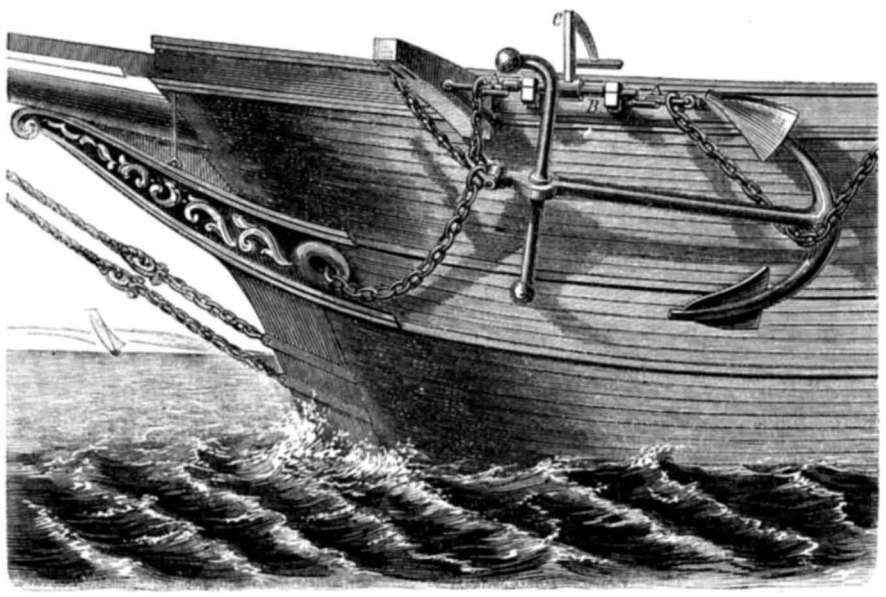
Improved Device for Tripping Anchors.

The ordinary mode of hanging a ship's anchor is by securing its ring near the cathead by a chain called a "ring-stopper," and bringing its flukes well up to the rail by means of a chain called the "shank painter" which passes around the shank of the anchor. The ends of these chains are fastened upon fixed hooks, or their equivalents, and when it becomes necessary to let go the anchor its fluke end is raised and one of the flukes hung on the rail until the end of the painter can be released, when the anchor is swung forward far enough to slacken the ring-stopper and allow one of its ends to be released, when the anchor may be let go. These successive operations require the strength of several men and a good deal of time, at a period when the labors of the men are required elsewhere and the time is of the greatest value.

The object of the anchor tripper seen in the accompanying engraving is to save this labor and time, and permit the anchor to be tripped instantly under all circumstances, which must be of very great value in cases of emergency when the lapse of a few moments may involve the loss of the ship.



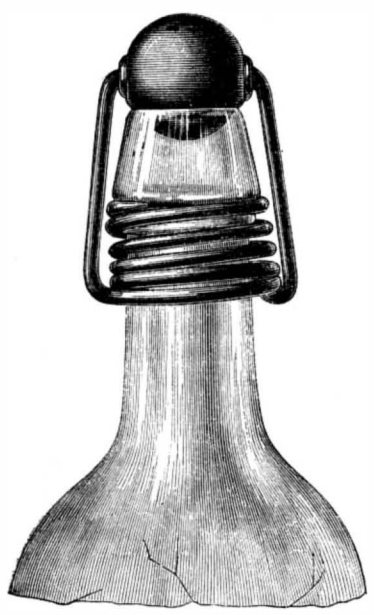
HEITMANN'S PATENT ANCHOR TRIPPER.

With this improvement both the ring-stopper and shank-painter are retained, but only one end of each is secured on fixed hooks, the other ends being held on pivoted latches, A, which, when not held in a horizontal position, are allowed to swing freely in a vertical plane. They are thus held by a bar, B, called a "keeper," which is sustained in bearings on brackets projecting from the ship's side. Each end of this keeper is off set and concaved to receive the ends of the latch bars as seen in the engraving. A bent lever, C, is securely fastened to the keeper by which it may be operated from on deck. This lever is represented in the engraving as partly raised so that its form may be seen; but when in its normal position, with the anchor slung, it rests upon the rail. It may be secured here by a catch if desired, but it is so shaped as to render its accidental displacement hardly possible, even without such precaution.

In operation the anchor is brought up to its proper position behind the cathead when the free end of the ring-stopper is passed through its ring and over the latch, A, which is then rested in the concave portion of one end of the keeper. The free end of the shank painter is then passed under the shank and the ring on its end slipped over the other latch, which is placed in the corresponding receptacle at the other end of the keeper. To trip the anchor it it only necessary to raise the lever, C, sufficiently to release the latches, when the anchor descends, held only by the cable through the hawse hole. This simple operation can be performed in an instant by only one man. The advantages of such a device are obvious to all those whose experience on the sea has learned them wisdom. It was patented through the Scientific American Patent Agency by Capt. B. H. Heitmann, who may be addressed at Galveston, Texas, relative to the sale of rights or the disposal of the whole patent.

Gould's Stopple for Soda-Water Bottles.

The design of the device shown in the engraving is to afford a ready means of opening and closing the aperture of soda-water bottles, the stopple being always attached to the



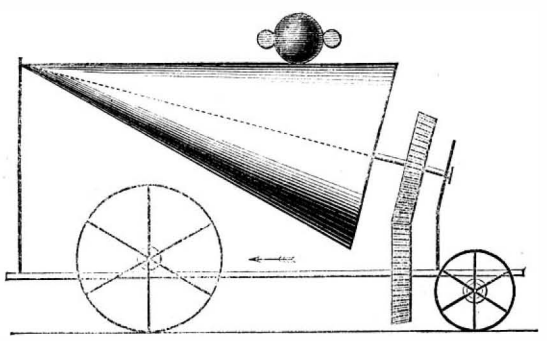
receptacle of the liquid. The stopple is simply a globe of rubber, or of any other elastic substance, turning on an axis passing through its center, the bearings of which are eyelets of metal to prevent wear. Around the neck of the bottle is a coiled spring, a portion of which passes through the sphere that forms the stopple and acts as the axle on which it turns. By the pressure of the thumb on the side of the stopple it can be rolled from its seat and returned, the tension of the spring retaining it accurately on its seat.

With this device there can be no loss of stopples. The enormous waste and consequent expense of corks is a very serious item of cost in securing the mouths of bottles, but in this device is entirely prevented. Patented July 30, 1867, by John H. Gould, Newburyport, Mass., who will reply to all interogatories relative to the improvement.

Dynamometers at the Paris Exhibition.

The friction brake is a very rude instrument for the refinement of modern engineering and machine making. It is a very useful and simple contrivance, and it is adapted to tell approximately how many horse power a water-wheel or a windmill gives out in its action, or how much power is consumed by a millstone or other uniformly rotating mechanism. But when it comes to the investigation of more complex and irregular movements, when such a question arises as what precise point or portion of a curved cam suffers the greatest strain during its revolution, and what proportion this strain bears to that which cams of other shapes or curves will have to undergo if substituted for the first, when it comes to watch and compare the relative consumption of power between different spinning and weaving machines, or between different headstocks of a mule, or between differently constructed parts of a single mule headstock—then the friction brake of course is no longer applicable, and a delicate, scientific, yet simply constructed instrument becomes a generally acknowleged desideratum. Such an instrument is what engineers now call a rotation-dynamometer, and a perfect instrument of this kind is yet to be designed. The name rotation-dynamometer is given to distinguish it from those instruments which measure and register linear exertions of power, or forces exerted in a straight line, such as the pull of a locomotive engine or of a tug-boat Dynamometers of that kind present no difficulty in their construction, and there exist a considerable number of such instruments all practically perfect, or nearly so, in their action and performance. Most of these instruments are based upon the production of a diagram, one element of which is represented by the tractive force or linear strain exerted, while the other element represents the time or space of movement through which that exertion had taken place. The area of that diagram representing the product of the tractive effort multiplied by the space through which it has been exerted gives the precise amount of work performed. The form and outline of the diagram itself in those instruments which produce a visible diagram of that kind indicates at the same time the precise fluctuations, changes, and other characteristic features connected with the exertion of power, and thereby gives one of the finest, most trustworthy, and useful records of the performances of machinery which we have in practical mechanics. The steam engine indicator is in reality nothing but a linear dynamometer registering the exertions of the steam pressure as connected with the space traveled through by the piston, and it is certainly one of the finest, most suitably contrived, and most perfect instruments at present at the command of mechanical engineers. For a rotation-dynamometer, the problem consists in producing the same register of power and space with regard to rotatory movements as the indicator gives for a straight-lined exertion of power. We require a diagram showing the amount and variation of power exerted upon a pulley by the belt running over it during the time that any given machine which is driven by that pulley performs its operation. The dynamometers hitherto made for this purpose suffer from several defects. Most of them are complicated and costly instruments, difficult to keep in order, and unreliable in their indications. Others of a simpler nature are interferred with in their indications by alternation of friction and other elements, such as the centrifugal force, which, varying in amount with the speed of rotation interferes with the indications of the dynamometer, which are then correct only at one given speed, and more or less far removed from the true mark as the speed differs from the normal velocity. The Exhibition contains two rotation-dynamometers; they are the best of their kind ever made, and both invented in France. Still our general remarks apply to both of them, and they leave plenty of room yet for any really simple and practical instrument of their kind. The two dynamometers we speak of are those of M. Taurines, in Paris, and of M. Engen Bourdon, the well known engineer of the same town. The dynamometer of M. Taurines is a very complete instrument. It was invented some five years ago, and used in a series of experiments made for determining the power consumed by different engineers' tools at the workshops in Indret, apparently with much success. It consists of a pair of pulleys mounted upon a solid shaft and upon a surrounding hollow shaft respectively, and connected together by a pair of segment springs. The transmission of power from one pulley to the other, through the action of these springs, causes the latter to alter their shape, and thereby a tension is exerted parallel with the axis of the two shafts which carry the pulleys. In this direction a small carriage, moving on four wheels and upon a pair of straight horizontal rails, is attached to the springs by a connecting rod, and this carriage is traversed forward and backward upon the rails, according to the action of the measuring springs connected to the two main shafts. The position of the carriage on the rails is therefore equivalent to the strain exerted through the pulleys, and corresponds to the position of the pencil point in the steam-engine indicator. The second element, or the space traveled through, corresponds to the number of revolutions made by the pulleys, and this is transmitted to the indicator in the following way:—

The carriage previously referred to carries upon its frame a long nicely finished cone, which revolves round its own axis in two bearings, mounted so that the upper line of the cone remains always horizontal. This cone is geared by a pair of bevel wheels, so as to revolve with the two driving-pulleys and to make the same number of revolutions. At the top of this cone, and in frictional contact with it, is a sphere guided between rollers which are also in frictional contact with the sphere. The contact between the cone and the sphere, theoretically, is a mathematical point, and this point corresponds to the pencil-point of the other indicators. Now as the cone revolvolves, the sphere follows the movement of the point of contact, and receives an amount of motion which is due to the circle described by the point of contact upon the surface of the cone during the revolution of the latter. The position of the carriage and cone upon the rail is therefore the element which determines the size of the circle of contact between the cone and the sphere. The annexed diagram shows the relative



position of these elements, and it will be seen from it that the movement of the carriage in the direction of the arrow brings the broader part of the cone in contact with the sphere, and that for one revolution of the cone the sphere will make a greater number of turns in proportion to the increased diameter of the circle of contact. The number of revolutions made by the sphere, and counted by a common engine counter moved from one of the small friction guides, is a fraction of the product of power and distance traveled through, or an equivalent to the work performed. It is necessary only to read off the figures of a suitably arranged counting apparatus to arrive immediately at the power indicated by this instrument, and so far, its use is very convenient; but, on the other hand, it cannot be denied that the apparatus is very complex, and that its elements are liable to derangements and inaccuracy on account of slip, particularly when exposed to sudden changes of power. M. Bourdon's dynamometer consists of a pair of pulleys, each on a separate shaft, and the two shafts are geared together by means of a pair of spur-wheels with inclined teeth. The inclined gearing exerts a longitudinal pressure proportionate to the strain transmitted through it, and due to the angle of the teeth. There is therefore an end thrust caused by this gearing, and this is taken up by one of the shafts which is free, endways, in its bearings, and presses endways against a spring. The spring transmits its movement to a pointer, and in this manner the amount of strain transmitted is registered upon a scale. This instrument, although simpler than the first, is liable to be interfered with in its indications by the changing influence of friction, and so we find ourselves compelled, in the face of those two best indicators yet made, to declare that an absolutely perfect instrument of the kind yet remains to be invented.—*Engineering.*

Watches at the Exposition.

No section of horology shows greater advance since the Exhibition of 1851 than that of pocket chronometers and watches. The most striking feature is an improved proportion of all the works; but the most essential points of improvement are the increased weights and diameters of the balances, the importance of which in the construction of a pocket watch is now fully established. Although France makes a larger exhibition of watches than England, those exhibited by the latter country are decidedly the best.

The escapements principally in use formerly in watches were the chronometer or detached escapement and the duplex; these, though excellent in themselves, are not well

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adapted for these railroad days, because they will not bear rough usage. They have accordingly been almost entirely superseded by the lever escapement, which is particularly suited for all the ordinary usages of life; and, when all the other parts of the watch are of the same quality as the pocket chronometer, a most reliable timekeeper is obtained. A watch with an uncompensated balance spring is seriously affected by changes of temperature, particularly when not worn habitually. Ten degrees of Fahrenheit causes a watch to vary seven minutes per week; hence the difficulty of regulating watches, except to the owner's particular wear; yet, if a watch be regularly worn, it is remarkable how nearly this error is balanced.

Great pains have been taken during recent years in England to improve the manufacture of ordinary watches. The best works are made in the Lancashire villages, and a considerable quantity of these works are annually exported to the United States, where they are cased and finished. According to the census of 1861, 23,427 persons were engaged in that year in the watch trade in England, the greater portion of whom reside in Lancashire.

Though the first-class chronometers in France are, as a rule, inferior to those of English manufacture, they are—and especially when considered in relation to the very important question of price—very remarkable for their general excellence. Pocket chronometers and watchmaking have been hitherto but a very secondary manufacturing interest in France; but of late years it has greatly revived.

It is, however, in cheap watches that France makes the greatest show. The efforts made by M. Goutard, of Besançon, to revive watchmaking in France, which were rewarded by a medal in 1862, appear to have been very successful. The clock and watch trade of France has, indeed, acquired enormous proportions during recent years. It is officially represented as amounting to 35,000,000 francs annually. The principal seats of the trade are for clocks, Paris; for watches, Besançon; and for large turret clocks, Monez (Jura). At Besançon 15,800 men, women, and children, are employed in the manufacture of watch movements. There are 132 workshops, and 150 houses in the trade give out work to be executed in the private dwellings of the artisans. The Besançon watch trade manifests considerable improvement since 1855. Of 223 exhibitors in the French department of watches and their movements, ninety-seven come from Besançon. In 1845 this town produced 51,191 watches; in 1855, 141,043; in 1865, 296,012; and the number is now said to surpass 300,000 annually. The declared official value of the watches and movements in 1866 was 17,000,000 francs. The principal establishment at Besançon is the Ecole Municipale d'Horlogerie, which maintains 250 pupils, and is directed by a professor.

There is also a large watchmaking trade carried on at the Cluses (Savoy), where there is a school for teaching watchmaking. St. Nicholas d'Aliermont is an important seat of this art; out of an adult population of 2,500, upwards of 1,000 are engaged in watchmaking. Astronomical clocks and chronometers are also fabricated here. The total number of timepieces annually made in this town is stated to be 144,000, valued at upwards of 1,000,000 francs. They are for the most part sent to Paris. It is worthy of remark that for the more delicate workmanship women are preferred, at St. Nicholas d'Aliermont, to men.

An attempt has been lately made by some Paris watchmakers to introduce a decimal system of time in watches, dividing the day into ten hours, the hours into one hundred minutes, and the minutes into one hundred seconds. The best illustration of this decimal division will be seen in the watches exhibited by F. Cacheleux (France.)

The watch manufacture of Switzerland is represented in the present Exhibition by one hundred and sixty-three exhibitors, sixty-seven of whom come from the Bernese Jura. It is not a little curious that, while France is now endeavoring to supplant Switzerland in the manufacture of cheap watches, the watch trade of the latter country appears to have come from France, which enjoyed a monopoly in making these instruments when their manufacture was unknown in Switzerland. This branch of industry, for which the latter country is so remarkable, is of comparatively recent growth, and is said to have been founded by French refugees who fled to these mountain villages for shelter from political persecution at the close of the last century. Even as late as fifty years ago it had not grown to any great extent; factories were few in number; a large number of the watchmakers being agriculturists or small farmers, who in the winter season devoted their time to watchmaking.

The repeating motion, for which Swiss watchmakers are now celebrated, had its origin in England; and when such complicated mechanism as that involved in the construction of a repeater is considered, it is evident that there must have been a large amount of mental mechanical ingenuity among the Swiss, for they had formerly little communication with England or France, access to these countries being difficult; and yet in a very short time after the art of watchmaking was introduced into Switzerland good watches were made, including beautiful and accurate repeaters. In 1851 the watch trade had grown to an enormous industry, some of the Swiss houses making as many as 500,000 watches yearly, and a large number running out their 10,000 and 20,000 per annum. These watches are not, of course, either of high class or high price. Most of the works continue to be made in the country parts of Switzerland; but those with beautifully finished cases and delicate workmanship are principally constructed in Geneva. The movements are almost entirely made in the Val de Joux, by various hands. A remarkable exception may be seen in the case of a repeater exhibited by August Baud (Switzerland, 3), all the parts of which have been constructed by himself. Watches will be found in this department from the humble, but by no means rough, watch, of 8 francs, to the pocket chronometer of 1,250 francs. Among the cheap watches are some curious specimens constructed, for exportation to China. A school for teaching watchmaking, founded in Geneva in 1824, turns out exceedingly fine work. Pupils are admitted at the age of fourteen, and many remain in the establishment four years and a half, during which time they are taught all horological processes. The terms are—for natives of Switzerland, 5 francs a month; and for those of other countries, 20 francs. Natives of Switerland also enjoy the advantage of being provided gratuitously with all necessary watchmaking tools. During the winter months the pupils have the privilege of attending gratuitous courses of lectures, given in the evening, on geometry, mechanics, and linear drawing. There are also four other schools in Switzerland, with professors at their heads.

The chief characteristic of the Swiss first-class watches is their horological ingenuity. Many combine movements of an extremely complicated nature, while the finish of the cases in the majority of the specimens exhibited leaves nothing to be desired.

Those interested in the curiosities of watchmaking will find in the French as well as in the Swiss department several extremely minute watches. The smallest is that exhibited by A. Rodanet & Co., which is set in the stem of a gold pencil.

It is worthy of notice that the fusee on which the English watchmakers rely so much in the construction of their best watches is entirely suppressed among the Continental makers. The absence of this important movement can only be accounted for by a desire to produce a cheap watch. Winding with the pendant—or, as it is popularly called, the keyless watch—is very general among the watches exhibited. This invention, however, is by no means so novel as is generally supposed, having been first introduced by Mr. John Arnold in 1823, for the convenience of a naval officer who had lost his right arm.

L. Gindraux, and R. Claxton, and S. Holdsworth, exhibit very complete and in many respects remarkable collections of clock, chronometer, and watch jewels, set and unset. They consist of diamonds, rubies, sapphires, chrysolites, garnets, and aqua marines, which are the stones used for horological purposes. There are jewel-holes of every description, clock and chronometer pallets, ruby rollers for the duplex escapement, ruby cylinders for horizontal movement; solid chronometer rollers, which serve the purpose of impulse and roller combined; ruby pins, flattened, oval, and triangular; caps and points for marine compasses, and draw-plate holes capable of drawing gold wire from 1,000 to 2,500 yards to the ounce troy. Mr. Holdsworth has also a case of assorted watch jewels for exportation, in order to meet a want long felt by watchmakers living at a distance from the place of manufacture, by which means they have a regularly assorted number of jewels in different sizes.

Switzerland exhibits a great variety of watch movements, jewels, and dials. The glass dials, with gold enamelled figures, exhibited by Corcelle-Tournier & Co., are extremely beautiful, and highly deserve examination.

Some machines are also shown in the Swiss department of ingenious construction, applicable to the manufacture of clocks and watches. It is worthy of remark that the clockmakers were the first who employed special machines for their manufacture. Their wheel-cutting engine has been ascribed to the celebrated Dr. Hooke, who is said to have invented it in 1655. Its use rapidly spread through England and the Continent. The gradual improvement of this machine, and the successive forms which it assumed as the art of construction was matured, form a very interesting history. English clockmakers have largely contributed to its perfection. Henry Sully, an English clockmaker, who removed to Paris in 1718, carried with him, among other excellent tools, a cutting-machine, which excited great admiration in that city. The form of the Continental engine is, however, derived from the engine improved by Hulot, in 1763. The fusee engine, which is another special clockmaker's machine, has also tended greatly to the perfection of machines for working in metal; and in many other ways the horologist has been of signal advantage to mechanical science.

There is, indeed, no branch of mechanical art on which man has devoted more labor than that relating to horology. Many artists in watchmaking work at artizans' wages, and many horologists of various countries cultivate their art *con amore*, devoting themselves to its improvement with extraordinary energy and assiduity.

The advantages to be derived from the possession of a clock or watch of perfect accuracy (were such a thing possible) could hardly be over estimated. The science of asronomy in particular would receive important benefit from such an instrument. But as no time-keeper has yet been constructed that can be relied on as being absolutely free from error, it is evident that there is still room for improvement. The sources of irregularity have long engaged the attention of many able scientific investigators; and, as we have seen, very numerous contrivances for counteracting them have been devised.

An impartial examination of the progress made in horological science since 1862, as represented by the Paris Exhibition of this year, is highly satisfactory. Absolute perfection has not, indeed, been obtained; but great progress has been made, and the result is that excellent timekeepers are much more common than they were a few years ago; and their prices, although wages have risen considerably during recent years, are much less than they were.—*Illustrated News.*

Science Familiarly Illustrated.

Chemistry of a Cup of Tea.

A little shrub grows in various parts of the world, principally in China and Japan, which produces leaves of a very remarkable chemical character; and vast numbers of people of all nations have somehow acquired the habit of steeping the leaves in water, and using the infusion freely as a beverage. The plant (*Thea Sinensis*) is a polyandrous evergreen shrub, growing three or four feet high, and bearing a white and somewhat odorous flower. According to botanical classification, it belongs to the camellia family, and is therefore allied to the beautiful flowering shrub which adorns our greenhouses and gardens.

It was evident to the earliest consumer that tea contained some mysterious principles which distinguished it from all other productions in the vegetable world but it remained for modern chemistry to unravel the mystery and point out the peculiar nature of these agents. Chemistry has solved many curious problems in the world of organized matter, but scarcely any more interesting than those connected with the tea plant. We learn from its teachings that there is stored up in tea a complex substance identical in composition with that found in coffee, cocoa and mate. It is called theine. This substance in coffee is called caffeine; in cocoa or broma, theo-bromine. Although the names are different, they are essentially alike in chemical composition. Tea affords a much larger amount than coffee; and the caffeine of commerce is in fact prepared by manufacturing chemists, from tea. Theine or caffeine is used to a considerable extent by physicians of the homœpathic school, as a hypnotic, or medicine for producing sleep, their theory leading them to employ an agent which causes wakefulness, to cure it. The element nitrogen enters largely into the composition of theine; and wherever we find this predominating in any alimentary substance, we may be sure that its effects upon the system will be of a marked or active character. Theine is prepared in the laboratory upon a large scale from spoiled tea, or that which is damaged in transportation black tea being preferred, on acconnt of its affording a better yield. One hundred pounds are usually manipulated at once, and from this amount about twenty-six or twenty-eight ounces of beautiful white, silky crystals of theine are obtained.

Besides this remarkable principle, tea contains tannic acid, to which it owes its astringency; a volatile oil, to which it owes its peculiar aroma; a large amount of caseine, and other substances common to all plants.

In order to present more clearly or precisely the chemical nature of tea, we may state that one pound of good tea contains about a third of an ounce of theine, two and a half ounces of caseine, one-twelfth ounce of volatile oil, two and a half ounces of gum, half an ounce of sugar, half an ounce of fat, four ounces of tannic acid. Mineral matter or ash, water, and woody fiber, make up the remainder.

Caseine, of which there is so large a quantity, it will be remembered, is the nutritive principle of milk; vegetable caseine, or legumen, is analogous in principle. Tea is therefore a highly nutritious substance, and fully capable of forming flesh and sustaining life. Peas and beans are highly concentrated forms of food, and yet analysis shows that the better qualities of tea are as rich in the nitrogeneous element or nutrient principle as are these seeds. Caseine is identical in composition with the muscular fiber and with the albumen of the blood, and is easy of assimilation.

In preparing the infusion, but little of the caseine is dissolved, and also but a small amount of tannin; therefore we throw away in the infused leaves these two preponderating principles. A cup of tea holds in solution the theine, volatile oil, sugar, and small portions of the tannin, gum, and caseine. Why should we not consume the infused leaves as food? We might do so, and secure a large amount of nourishment; but the presence of so much insoluble tannin would produce astringent effects of an unpleasant character. Remove this and exhausted tea leaves might at once be regarded as a valuable dietary article.

In preparing a cup of tea, we employ water heated to nearly or quite the boiling point, as experience has proved this temperature to be necessary to dissolve out the principles desired. The peculiar solvent powers of water are wonderful, not only when considered in connection with tea leaves, but all other substances upon which it exerts specific action. Its solvent powers are wisely controlled and limited, and its physical and chemical relations to all substances, organic and inorganic, are marvelously adjusted. But, however strongly tempted to enlarge upon this point, we can only call attention to its effect upon tea. Its power over tea leaves is limited, and it can dislodge and hold in solution only such principles as are necessary to form the beverage in the highest perfection. Suppose it was capable of dissolving all the tannin, the infusion would be more in place in the vats of the tanner than upon the tea table. However nourishing and healthful is the caseine or gluten, it would, probably, if the whole amount were present in tea, impair its flavor, and interfere with its charactiristic appearance and effects. The adjustment of its solvent powers upon tea is probably perfect, when the condition under which it acts are understood and adhered to. It is capable by long-continued boiling, in connection with tea, of extracting an undue proportion of tannin, and thereby rendering the infusion unpleasantly astringent; but no amount of boiling will render one half of the whole quantity soluble.

No chemical substance can be added to tea to improve its flavor or general healthfulness. Some of the alkaline carbonates, like soda, aid the water in dissolving the caseine, but its addition spoils the tea.

If the soil and the conditions of our climate were favorable

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for the cultivation of the tea plant in our gardens, it would be of but little service to us unless we were acquainted with the nice methods of drying or curing it. The green leaves when first removed from the tree, are like the leaves of most other plants, having but little astringency, no odor or bitter taste. Like coffee, the peculiar characteristics of tea are developed by roasting; and this is a very nice process. The Chinese are so adroit at the business as to be able to prepare a half-dozen qualities of tea from the same leaf. Important chemical changes are wrought in the leaf by the process of drying and roasting, so that the same leaf furnishes the green and black tea of commerce.

As regards the exact physiological effects of tea upon the upon the animal economy, different opinions continue to prevail. It is quite unnecessary to discuss this point. The writer has for a series of years carefully observed its effects upon himself, and is free to state, that it is no matter of wonder with him, that "brain workers," in all the years since tea was introduced, have regarded it with the highest favor. It has a power to subdue irritability, refresh the spirits, and renew the energies, such as no other agent possesses. When the system is exhausted by labor or study, a cup of tea re-invigorates and restores as no form of food or other beverage can. As regards the ultimate effects of tea-drinking, it can be said that Bishop Huet, of Avaranches, the celebrated scholar, who wrote in its praise at the age of ninety, affords by no means a solitary instance of longevity coupled with its free use. Tea saves food by lessening the waste of the body, soothes the vascular system, and affords stimulous to the brain. The young do not need it; and it is worthy of note that they do not crave or like it. Children will frequently ask for coffee, but seldom for tea. To aged people whose powers of digestion and whose bodily substance have begun to fail together, it is almost a necessity. Like all blessings, it is liable to abuse, and hence has arisen much of the prejudice against its use. There may be some declaimers against the moderate use of tea, whose consistency or moral sense may not be unlike that of Mr. Henry Saville, who writing to his uncle, Secretary Coventry, about two hundred years ago, remarked that many of his friends "had a base unworthy Indian practice, in calling for tea, instead of pipes and bottles after dinner." If the use of tea is a pernicious habit, we may remark, as did the same writer at the close of the letter to his uncle, "The truth is, all nations are growing so wicked as to have some of these filthy customs."—*Boston Journal of Chemistry.*

Weather and Mortality Chart.

Dr. W. F. Thoms, of this city has prepared a very interesting and valuable chart exhibiting in the plainest manner the principal facts concerning the meteorology and mortality of the city of New York during the year 1866. The chart has a surface of only about one and a half square feet, yet if the information it gives were put in the ordinary form of tables it would fill a large volume. This economy of space and plainness of detail is secured by representing the facts by lines of various colors and positions. The chart will serve admirably as a model for keeping meteorological records.

As an example of the comprehensiveness of the chart, we quote the following facts which are presented concerning the week ending July 21st:—

Mean Temperature—Thermometer	83
Highest Range of Temperature	102
Lowest Range of Temperature	60
Mean Weight of Atmosphere—Barometer	29·96
Highest Range of Barometer	30·10
Lowest Range of Barometer	29·87
Mean Humidity	48
Inches of Rain	1·4
Days of Easterly Winds	4
Days of Westerly Winds	3
Days of Clear Weather	4
Days of Cloudy Weather	3
Total Mortality—Deaths from all Causes	1,362
Mortality from all Diarrheal Diseases	442
Mortality from Cholera	48
Mortality from Inflammation of Lungs	18
Mortality from Typhus and Typhoid Fevers	16

The chart is published by D. Appleton & Co., 443 Broadway. Price $1.

MALLEABLE CAST IRON.

Malleable cast iron, as has been proved by the careful experiments of M. Tresca, has a coefficient of elasticity and an elastic limit equal to that of good wrought iron. For a repetition of complicated articles difficult and expensive to forge, we cannot imagine a better material; and there can be no doubt that malleable cast iron has not yet had justice done to it by the engineer. Though its manufacture is getting rather widely spread on the Continent and in England, it is yet in the hands of comparatively few people, and is, in fact, almost secret. The most noted English malleable cast iron founder is Mr. John Crowley, of the Kelham Works, Sheffield, and of Manchester. A bar of his manufacture, five sixteenths of an inch in diameter and about a foot long, with a fracture like steel, is now before us. Few would guess that large quantities of such rods are cast to make the common fish-tail gas burners by cutting them up and turning and boring them in the lathe.

The discovery of the process of making cast iron malleable is ascribed to Samuel Luças, whose specification describes the chief features of the mode still adopted in the manfacture. Dr. Percy has pointed out that Reaumur, as long ago as 1722, published this process. The difference between the positions of Reaumur and the Lucases—Samuel and Thomas—in the matter is, that Reaumur never carried out the discovery on a commercial scale, and that he left this to be done by the Englishmen. In any case, Reaumur seems to have preferred the use of a mixture of chalk or of calcined bones, and not red ore, for decarbonizing the metal.

The pig iron used in the manufacture of malleable cast iron must be free from phosphorus and sulphur. The best materials are hence Swedish and Styrian pigs, made with charcoal from the purest ores. The last kind is used in the southern parts of Germany, but its price makes it impossible to employ it in England or even in northern Germany. The most usual material is hence pig iron made with coke from the hematite ores of the Cumberland districts. A small proportion of Swedish pig is sometimes, but probably very rarely, added. The pigs with the whitest fractures are preferably employed for larger castings, and those with a grayer fracture for smaller articles. As is usual in these cases. the proportions of the mixtures used are made a mystery by the different makers, but there can be little in this, as different establishments use pigs with different brands and varying mixtures. The principal thing is evidently to have as little phosphorus or sulphur as possible. Some years ago a patent was taken out in France for mixing in the crucible from two per cent to seven per cent of red copper with the cast iron intended to be made malleable, in order to give it more fusibility, and to obtain castings with a better surface. We are not aware, however, whether this plan has been much adopted.

The pig is usually melted in crucibles, sometimes of plumbago, and holding about fifty or even sixty pounds—the usual size of steel crucibles—which, in the ordinary method of pouring out by hand, is determined by what an ordinary man can lift. The crucibles are covered up, in order to prevent the access of impurities from the coke, with a consequent waste in skimming the fluid metal. As with the crucibles, the furnaces used are generally those employed in melting pot steel, being from two to three feet square, and holding four crucibles. No blast is used, as the resulting saving in time would be counterbalanced by the increased consumption of coke. In this part of the process the principal point is to attain as high a temperature as possible for pouring the metal into the mold. The melter mostly tells this by dipping a red hot iron bar into the crucible, on withdrawing which the fluid iron should spring off in sparks. The crucible is then taken up by a pair of tongs, and, after skimming the surface of its contents, it is emptied as quickly as possible.

The molds are made in green or in dry sand in the usual manner, but great care has been taken with the small and complicated details, the molding of which forms the most economical application of malleable cast iron. These are best cast together and broken off when cold. With heavier and more complicated castings it is very important carefully to determine where to place the feeders for forming, so to speak, reservoirs for holding the extra fluid metal intended to follow up the shrinkage. If this be neglected, small cracks are produced, which are completely visible under the subsequent operation of annealing. Such feeders must not be placed at any sudden changes in shape of the casting, such as at any corners—*e. g.*, at the pins cast on levers, and so on. The castings produced are remarkably brittle, and many wasters are produced in cleaning them. This operation is best done when they are thoroughly cooled down. To delay this till after the annealing process would of course be attended with the obvious difficulty of having to deal with a tough, malleable material. It is also important to take the castings out of the molds as soon as possible, in order to avoid the production of cracks, as the shrinkage in cooling is considerable. In fact, almost double the usual allowance for shrinkage must be made in the patterns, though this sometimes varies, as might be expected, with the mixtures employed. The molding boxes are set either quite vertical or at a considerable inclination. The first position is always employed with smaller castings. The molding should be done very neatly, in order to save as much as possible any cleaning after annealing.

The last and the most important, difficult, and expensive process is decarbonizing or annealing the castings. They are placed, together with powdered hematite or red ore, in cast iron cases or muffies, and kept at a high temperature for a long time. These boxes, cast with sides about an inch thick, either have covers or are piled in the furnace one above another, any openings or cracks being luted with clay. Only round muffles were used at one time, but square boxes are now employed. The castings are packed in these boxes with alternate layers of hematite ore, which is placed so as to form both the bottom and the top layer. In packing the boxes with hematite care must be taken that thin and thick castings do not come together. The boxes containing the larger ones must also be set in the furnace nearest to the fire, and those with the smaller articles in the hinder part. If this is not done, in the first case the smaller castings are burnt. and in the second the larger ones get only half decarbonized.

The decarbonizing furnace is simply constructed; the grate is in front, and the fire gases are induced between the boxes placed in the hinder part of the furnace. Or they may consist of square chambers with an inlet at the side from a door for charging and discharging; and with a bottom divided into longitudinal rows, between which are placed two or three narrow gratings extending the whole length of the furnace. The flues open from two places in the roof. A damper at the side serves to watch the firing, which must be done with great care, and any access of air to the castings prevented. On lighting the fires the temperature is raised to a bright red at the end of twenty-four hours; this heat is then regularly kept up for three, four, or even five days, according to the size of the castings and the amount of annealing it is wished to give them. At the end of that time the fire is allowed to fall and the temperature to diminish during twenty-four hours; when the furnace can be opened and discharged. The boxes are then unpacked and their contents cleaned. The annealing operation is a very delicate one. With too high a temperature, should the hematite be not mixed with a sufficient proportion of previously used ore, or should the air make its way in, the castings are most likely burnt. An unequal or a too low temperature has for result an imperfect decarbonization and brittle castings. The most considerable expense in this manufacture consists in the renewal of the cast iron cases, which easily crack under the heat, and cannot often be used more than once.—*The Engineer.*

MANUFACTURING, MINING, AND RAILROAD ITEMS.

Two lines of telegraph connect Jerusalem with Europe.

The railway over the Alps, is known as the "Fell railroad" from its being constructed in accordance with the patents granted to a gentleman of that name,

To pass through the Mount Cenis tunnel, when it is completed, will occupy over half an hour, and it is for this, among other reasons that many expect the over-mountain railway,—which only possesses a concession for working until the tunnel line is opened for traffic—will have its privileges extended so as to make it practically a permanent concession.

The total annual value of the gold and silver manufactures in France is set down at $19,128,000, The number of manufacturers is 1,250, and 20,500 persons find employment in the trade. Since 1855 the masters and workmen have formed themselves into a common association for the amicable adjustment of their respective interests.

The zinc mines of Lehigh county, located near Friedensville, in Saucon township, Pa., have been worked for fifteen years. The ore is carted to South Bethlehem and then made into oxide of zinc and metallic sheets. A singular fact in relation to these mines, is that the working of one shaft to a depth of 150 feet, has drained all the wells and springs for three miles up and down that part of the valley, and left the inhabitants no alternative but the use of surface water.

The Strasbourg line of railway, has introduced a three story passenger railroad car. The ground floor is the first class, the second class apartments above, while third class passengers must climb to the highest story.

The value of improvements in machinery may be estimated from the fact that in 1819 it required two furnaces, each with a high chimney shaft, to produce 1000 feet of glass per week, while now two furnaces, with but one shaft produce 12,000 feet, with the same if not a smaller consumption of fuel.

Sweeden owns 500 iron mines which yielded in 1864, half a million tuns of ore. All the smelting and refining processes are carried on with wood charcoal. Very little bar iron is manufactured, the annual productnever exceeding 300,000 tuns of pig. By the Bessemer process some 3,200 tuns of steel were produced in 1864. The amount of cast steel in the same year was 4,500 tuns.

The corner stone of the Cameron Railroad Bridge across the Missouri river at Kansas City, Mo., has been laid and the structure is to be finished in one year. The bridge will be of iron 1,400 feet long and with a draw in the river channel of 362 feet. This bridge with the one now building across the Mississippi, at Quincy, will furnish direct communication with New York and Boston, and make Kansas City an important distributing point.

The Mount Cenis tunnel will be lined in its entire length with stone quarried in the immediate vicinity of the two entrances. At the present time, the excavations, or headings, are about 1,500 metres in advance of the amount lined.

The total length of electric telegraphs in the world, not including the submarine, amounts to upward of 180,000 miles, which is more than enough to go round the earth half a dozen times.

That portion of Pensylvania purchased from the Indians in 1749, for the sum of $500, embraced all the middle and southern coal fields. The northern, or Wyoming and Lackawanna district, was part of a purchase, reaching from the south-western to the north-eastern boundaries of Pennsylvania, and the whole area cost but $10,000.

Iron ore is found in every part of Italy and yields from forty-five to sixty five per cent of excellent iron. The mines are situated at considerable hights above sea level, and though almost inaccessible in winter, this is the only season when they can be worked on account of the quantity of water and badness of the air at other times of the year. There are only thirty eight blast furnaces in the whole country. The number of establishments for making machinery is seventy, but the raw material used, is almost wholly of foreign origin. At Genoa and Naples locomotives and tenders are turned out, but their actual cost is greater than those imported.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

SPINNING JACK.—A. B. Woodbury, Ashuelot, N. H.—This improvement relates to an improvement in spinning jacks, and consists in devices to be attached to a common spinning jack, which shall compel the spinner to draw the jack out the full distance to the bumpers.

ADJUSTABLE PARALLEL SHIP BUILDER'S MOLD.—Jesse J. Cassidy, Wilmington, N. C.—The nature of this invention consists in providing an instrument for the use of ship builders, by which the lines of curved patterns may be readily and accurately transferred to the timbers to be hewed and dressed for building a vessel.

ECCENTRIC BORING BAR FOR SCREW CUTTING.—E. S. Chapell, Milton, Mass.—This invention relates to an improved construction of a boring bar for cutting screws and nuts, or internal and external screw cutting, and consists in a round bar with eccentric centers or turning points in the ends, provided with a head sliding and turning freely thereon.

THILL COUPLING.—John Knox, Mount Gilead, Ohio.—This invention relates to an improvement in the construction of a coupling for the shafts of buggies, wagons and other light vehicles, and consists in employing a coupling pin with a ring, groove, or recess around the middle, in which is fitted the end of a spring secured to the shaft and let through the eye, to hold it in place, instead of a screw and nut in the ordinary way of fastening the coupling pin. This device has the advantage of great convenience in readily attaching and detaching the shaft from the wagon, together with the security and safety of the fastening.

HAND HAY RAKE.—J. S. Grant, Sidney Center, Me.—This invention relates to a hand rake designed for raking and gathering light grass and scatterings of hay from a cart or windrow, for gathering grain straw from the swath into gavels for binding, and also for gleaning in the grain field, especially where the stubble is cut high, all of which work is accomplished without stopping or lifting the rake from the ground.

BRICK PRESS.—W. L. Drake, Sturgis, Mich.—This invention relates to a machine for pressing bricks after being molded either by machinery or by hand, and when sufficiently dry or hard to receive and retain an impression. The object of the invention is give the bricks a pertect shape, sharp or circular corners, and also give one side a concave surface, which is desirable in order to form interstices to receive and hold the mortar in laying a wall.

FLY OR BALANCE WHEEL.—Robert Rice, Mineral, Ill.—This invention consists in constructing a fly or balance wheel with a series of internal chambers arranged in such a manner that by partially filling said chambers with water or other suitable fluid, the gravity of the latter will be rendered subservient as an assistant motor or an economizer of power.

CHUCK FOR LATHES.—James M. Smith, Seymour, Conn.—This invention relates to a chuck for turning lathes, and has for its object simplicity of construction, facility in manipulating it to hold or grasp articles to be turned or drilled, and also to release said articles, and also the admission within the chuck of long articles, such as rods, drills, or other articles to be held by it, for which ordinary chucks are not adapted.

FLY NET.—Geo. W. Lee, Jerusalem, N. Y.—This invention relates to a new and useful improvement in the construction of leather fly nets for horses whereby with the same amount of stock a net is made more durable and to have a lighter appearance than usual.

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LOCK.—E. L. Gaylord, Terryville, Conn.—This invention relates to a lock of that class which are designed for articles having lids, such as pianofortes, sewing machines, etc.

SCREW PLATE FOR CUTTING SCREWS.—Henry Gill. Mansfield, Ohio.—This invention consists in providing a screw plate with circular dies fitted in sliding or adjustable plates which are placed on guide rods secured in a stock and all arranged in such a manner that the dies may be turned so that a fresh or new cutting surface may always be obtained whenever the dies become worn at one point. These circular dies are flattened or cut off so as to have plane surfaces, to admit of the dies working or cutting up to a shoulder on a bolt or rod.

LOCK.—W. H. Murphy, Versailles, Ohio.—This invention relates to a novel arrangement of parts within the lock, whereby to draw in the bolt a certain combination of movements must be performed with the key.

TANNING COMPOSITION.—William Johnson, Shirleysburg, Pa.—This invention has for its object to furnish an improved composition for tanning which will tan the skins thoroughly in a very short time.

COMBINED SNAP HOOK AND BUCKLE.—Seth W. Perkins, Geneseo, Ill.—This invention has for its object to furnish an improved combined snap hook and buckle, simple in construction, strong and durable, easily attached and detached, and which can be manufactured at a comparatively small expense.

YARD FOR SHIPS.—E. Masters, Cleveland, Ohio.—This invention has for its object to furnish an improved yard for ships, stronger, lighter, more durable and more easily repaired than those constructed in the ordinary manner.

SPRING BED BOTTOM.—J. S. Grant, Sidney Center, Me.—This invention has for its object to furnish an improved spring bed bottom, simple, effective, and reliable in construction, and which can be so adjusted as to form a spring bolster or elevated back support for an invalid.

MACHINE FOR GATHERING AND HUSKING CORN.—J. D. Hill, Fort Scott, Kansas.—This invention has for its object to furnish an improved machine by which corn may be gathered and husked automatically as the machine is drawn through the field.

BOTTLE STOPPER.—H. S. Carley, Cambridgeport. Mass.—This invention consists in securing to the stopper two or more wire rods which project from the under side of the stopper and are inserted into the bottle. The rods are spread apart by their own spring so that their lower ends press against the inside of the neck of the bottle. At their lower ends they are bent out so that they can catch under a shoulder formed on the inside of the bottle.

WAGON SEAT AND SPRING.—R. L. Allen, New York City.—This invention relates to a new manner of hanging seats on heavy one or two-horse trucks, or other device, and consists in so arranging springs under the seat that they are made perfectly elastic and in hinging the springs to the supporting posts so that the seat and all its appendages can be swung forward and out of the way whenever desired.

STEAM ENGINE GOVERNOR.—John Eddy, Barnesville, Ohio,—The object of this invention is to render the action of the ordinary centrifugal governor more sensitive to variations of speed in the engine than is usual by the common method.

HAND PLOW AND HOE.—Daniel W. Colburn, Loami, Ill.—This invention consists in constructing the blade of a hoe with a curve or bend somewhat similar to the mold board of a plow so that it will, when in use, cast or throw the earth to one side. It also consists in attaching the blade to the handle in such a manner that it may be reversed and used either like an ordinary hoe or by shoving it forward operate like a plow and make a continuous furrow to receive seeds.

CRANK MOTION.—A. Bicknell, Boston, Mass.—This invention consists in arranging two or more auxilliary connecting rods with the pitman and cross head of a steam engine for the purpose of enabling the engine to start from any point at which the piston may have been stopped or any position of the crank, and also to enable the piston to exert its power more advantageously and economically in passing the dead centers than can be done with a pitman alone in the ordinary connection.

DIAL PLATE BUTT HINGE MACHINE.—Adrian Rais, Waterbury, Conn.—This invention relates to improvements in machinery for making butt hinges and consists in mechanism so constructed that the two right and left match blanks which form a butt or hinge shall be conveyed from feed boxes respectively by automatic devices to and upon the periphery of dial plates or disks which rotate and first present the blanks to dies for bending the knuckles, after which operation they are presented to the mills and after they have been milled are carried opposite and introduced into a nailing device where the match blanks are united and fastened together by the nail or rivet and when thus finished are discharged from the machine. The whole operation is therefore automatic and continuous from beginning to end.

WAGON LOCK.—Andrew Downer, Hammondsville, Ohio.—This invention has for its object to furnish an improved lock or brake for attachment to wagons with which the action of the horses in holding back and drawing will apply the brake to and remove it from the wheels, and with which the reverse movement of the wheels in backing the wagon will remove the brake shoes or rubbers out of the way.

APPARATUS FOR RAISING SUNKEN VESSELS.—Richard W. Hallett, Hudson City, N. J.—This invention has for its object to furnish an improved apparatus by means of which sunken vessels may be easily raised to the surface of the water and floated to any desired place.

VISE.—H. E. Long, Plymouth, Mass.—This invention has for its object to furnish an improved vise, the head of the movable jaw of which shall be so constructed that it will adjust itself to the various forms and thicknesses of the objects held without its being necessary to adjust the position of the lower end of the movable jaw every time a different article is placed in the vise.

HAY ELEVATOR.—G. F. Hipp and J. B. Fast, Nova, Ohio.—This invention has for its object to furnish an improved machine for operating a hay fork or elevator more conveniently and satisfactory.

SLED.—Jacob Shaaber, Reading, Pa.—This sled is so constructed that its two sides with the seat, which is made of flexible material, can be folded together and opened from each other, and in the latter position, by the simple weight of the person upon the sled, is there held and sustained.

CLAMP FOR HINGES.—Eli L. Seger and Samuel L. Smith, Yonkers, N. Y.—This clamp is intended for butt hinges, more particularly, and is so constructed that it can be placed over the leaves of a hinge when closed and so operated as to firmly and tightly hold and bind them together, thus preventing their being opened one from the other until the clamp is released.

FIRE ESCAPE.—T. S. Diblin, New York City.—This invention relates to a fire escape of that class in which a flexible ladder is employed. The invention consists in an improved manner of constructing a flexible ladder for the purpose, and in a peculiar manner of securing the windlass to the window sill, whereby the windlass, with the ladder secured upon it, may be adjusted and firmly secured in an open window very expeditiously wherever the device is required for use, the flexible ladder being unscrewed from the windlass so that the occupant of a building may descend from the open window to the ground or pavement.

CULTIVATOR.—W. A. Moody, Montezuma, Iowa.—This invention consists in an improved manner of applying the plow beams to the frame of the machine, whereby the same may be moved or adjusted with facility and be under the complete control of the device or operator. The invention also relates to an application of the double tree to the machine whereby the same may be balanced in order to relieve the necks of the draft animals of any undue weight.

ALARM MONEY DRAWER.—Ira Robbins, Hughesville, Pa.—The nature of this invention consists in constructing an alarm money drawer, which, in order to be opened, is operated upon by keys on the under side of the drawer which will cause the bolts to fall and allow the drawer to be opened by turning and pulling the handle thereof.

MILLER'S ALARM.—C. N. Taylor, Cookstown, N. J.—The object of this invention is to so arrange a miller's alarm, that as soon of the corn in the hopper descends to a certain mark the alarm will be sounded.

DIAMOND KEY.—B. F. Southgate, Bridgewater, Vt.—This invention relates an improved key for holding cranks, shatts, and other machinery, and consists in a wedge shaped key, the section whereof is a diamond fitting into a V-groove in the crank or shaft and into a V-groove corresponding thereto in the bearing.

PUMPS.—E. C. Kellogg, Rome, N. Y.—This invention relates to cattle or stock pumps, and is adapted for forcing water from wells by the weight of the animals when standing upon the platform suitably connected with the pump therefor.

PITCHER.—W. S. Rooney, Albany, N. Y.—This pitcher is more especially designed for sirups, and is so constructed at its nozzle as to prevent the drippings from running down the outside of the pitcher, and to convey them back into the body or reservoir of the pitcher.

CHARGES FOR SHOT POUCHES.—Columbus Johnson, Clarksville, Mo.—This charger is constructed with two tubes, one arranged to slide within the other and with the outer one provided with an opening communicating with the pouch, and an opening communicating with the discharge spout or tube, and with the inner so constructed and arranged that by pushing or forcing it in, the opening to the pouch is closed at the same time the opening to the discharge is opened, so that the shot contained within the inner tube between the openings of the outer and discharge tubes, compress to the discharge tube and thence out of it to and into the barrel of the gun.

ADJUSTABLE RAIL FOR BUGGY SEATS.—James Carlisle, Mount Gilead, O.—This top-rail adjusts itself to the seat by its own spring, and is there held by the fastenings with which it is provided.

MACHINE FOR SAWING WOOD.—G. C. Lathrop, Danville, Mich.—This invention relates to a hand-sawing machine, which can be operated by one man, who is seated in a swinging chair, and which can be adjusted on uneven ground, so that it will always stand in a level position.

POWDER PRESS.—William Welch, Bridgeport, Ct.—This invention relates to an improvement in the manner of securing the cap for covering the sliding box in the gate of a power press, to the gate, said sliding box being the bearing for the eccentric shaft whereby the gate is operated.

SCALE BEAM.—Elisha P. Crain, New York city.—This invention relates to a device for strengthening the graduated lever used on platform or counter scales, so that the same may be held in its seated position, and will remain in the same.

TRACE FASTENER.—Chas. Hayden, Newark, N. J.—This invention relates to a device for attaching traces to whiffletrees, and consists in pivotting a slotted plate to the end of a pin, which is secured to the whiffletree in such a manner that the same may form a continuation of the pin, when the brace is to be attached or removed, or it will be at right angles with the same when the trace is attached, thereby securely holding the latter in position.

MACHINE FOR MAKING BUTTON RINGS.—S. B. Lane, Waterbury, Ct.—This invention relates to a machine shaping and cutting from a long wire, small pieces, or rather making from the wire small circular springs for fastening vest, and other buttons.

LEATHER-BACKED HORSE BRUSH.—Obadiah Jones, South Englewood, N. J.—This invention relates to a new kind of horse brush, and to the manner of making the same, and consists in making a leather-backed, round-faced horse brush, and in inserting a cone, which is made of one or more pieces of leather, or other suitable pliable material, between the back and face leather coverings, whereby the desired shape is given to the face cover, in which the bristles have before been secured.

HOSE COUPLING.—Albert S. Allen, Providence, R. I.—This invention relates to a new device by which the water can be easily discharged from hose, and by which firemen will be better enabled to carry such emptied hose up ladders, or along the ground or floors.

BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.—This invention consists in having a slotted cork holder which can be moved up and down, being guided by a pin projecting from a ring or collar which is arranged around the neck of the bottle. The same pin carries an eccentric cam, which can be turned so as to press upon the cork holder, thereby pressing the cork into the mouth of the bottle, and holding it there.

HAY KNIFE.—H. M. Smith, Kalamazoo, Mich.—This invention relates to a hay knife for cutting hay from the mow or stack, and it consists in a peculiar construction of the knife, whereby the hay or straw may be cut from the mow or stack with the greatest facility, and with a moderate expenditure of power.

DEVICE FOR ADJUSTING THILLS IN CARRIAGES.—M. J. Mellyn, Roxbury, Mass.—This invention consists in constructing a peculiar-shaped lever gripe, whereby the rubber or elastic substance which is placed in contact with the thills of a buggy to prevent rattling, is compressed so that the thills are easily attached.

SELF-MEASURING CAN.—T. D. Arkle, and H. C. Green, Bridgeport, Ohio.—This invention consists in forming a measuring vessel inside a can, into which the liquid is discharged, and the quantity which it is desired to measure is indicated on the outside of the can by an index finger, which is operated by a float in the measuring vessel.

SHADE FIXTURE.—Stewart Hartshorn, New York city.—This invention relates to an improvement in that class of shade fixtures, in which the shade roller is provided with a spiral spring for automatically winding up the shade, and is designed to obviate an objection attending the original device, which consisits in the unwinding of the spring whenever the shade roller is removed from its brackets or bearings, a contingency which involves the necessity of winding up the spring previous to the replacing of the roller in its bearings, and which cannot be done by an unskilled person without considerable difficulty.

FAN.—J. Bloom, New Brunswick, N. J., and A. Bloom, New York city.—This invention consists in a novel combination and arrangement in connection with gearing actuated by springs, of one or more wheels, suitable for agitating and forcing the surrounding air in one or more directions; or of one or more holders, suitable to receive the stems or handles to the fans in common use, and thus, through such holders, and the fans which they carry, produce the desired agitation of the air, either by imparting to such holders a rocking, or forward and backward, or a rotary motion.

CLOTHES DRYER—Robert M. Morriell, Plymouth, Ind.—This invention has for its object to furnish an improved clothes dryer so constructed and arranged as to have a very large amount of drying surface in a comparatively small space and when not in use may be folded into a very small compass.

BURGLAR ALARMS.—E. F. Mallory, West Springfield, Pa.—This burglar alarm is so constructed and arranged in its several parts that as the door or window is opened to which it is applied, an alarm will be sounded.

CLOTHES PINS.—J. P. R. James, Read's Landing, Minn.—This invention consists in a novel combination and attachment of a spring to the jaws of a clothes pin whereby the spring cannot become loose, nor detached from the pin.

CENTERING TOOL.—Reuben Haworth, South New Market, N. H.—This invention consists in a spindle which is attached to the lathe which spindle holds the centering drill in its end and around which there is a sleeve which supports a centering cup which sleeve and cup are crowded forward by a spiral spring.

OIL CAN.—George Hatch, Pomeroy, Ohio.—This invention consists in placing in the can, near its top, a horizontal partition or false bottom which extends about three fourths across the diameter of the can forming thereby a recess, on which bottom or partition I place a lifting pump and a drip strainer.

UNIVERSAL JOINT.—Anton Zwiebel, Burlington, Wis.—The object of this invention is to construct a universal joint that is to be used especially on thrashing machines, which is made without projecting bolts or pins, and which can be easily taken apart for renewing the knuckle joints, when the arms are worn out.

CONSTRUCTING ORDNANCE.—T. W. Hornsby, Simpsonville, Ky.—This invention relates to a mode of constructing wrought iron and steel ordnance which may be made in whole or in part of steel, wrought iron, or any other metals that are susceptible of being worked into ordnance in conformity to this improvement.

EXTRACTING AND PURIFYING OIL.—Carl Otto Heyl, Berlin, Prussia.—The object of this invention is to extract oil from all oleagemous seeds principaly by the instrumentality of a chemical agent, and the invention consists in subjecting the crushed oleageneous seed to the action of sulphuret of carbon when the seed is placed in a vase or series of vases and in passing the products, or oil, through a distilling apparatus.

VARIABLE CUTT-OFF.—J. L. Dickinson, Dubuque, Iowa.—This invention consists in placing an oscillating cut-off valve in communication with the steam chest of the engine, and in attaching to the rod or stem of the oscillating valve an arm, which is operated by two eccentric rods having different motions which are connected with the arm by means of a slide, the position of which slide on the arm is controlled by the governor, thereby cutting off the steam at an earlier or later point also decreasing or increasing the throw of the cut-off valve.

OBSTETRICAL SUPPORTER.—S. B. Manley, Cony, Pa.—This obstetrical supporter is so arranged as, in all cases of obstetrics, to be efficidnt and serviceable, and when applied, to cause every exertion made by the patient, whether with the feet, hands, or knees, to impart all the necessary and desired assistance.

GRAIN METER.—James C. Walker, Waco Village, Texas.—In this invention the grain is ponred into a cylinder shute, where, in falling, it rotates a wheel, the revolutions of which, recorded by an indicator, mark the quantity of grain.

COTTON AND HAY PRESS.—John S. Schofield, Macon, Ga.—In this invention the arms which operate the screw do not rise and fall with the screw. Secondly, the press can be worked upward or downward, by hand, by horsepower, or by any other power.

METHOD OF CASTING ALUMINUM IN FINE MOLDS.—Jas. B. Bean, Baltimore, Md.—In this invention the metal is cast into fine molds, under pressure of a high column of the metal itself, contained in a conduit of soapstone, earthen ware, or other similar substance, heated to about the melting point of the metal to be cast. The molds, at the moment of casting, are filled with hydrogen, or other gas, containing no oxygen.

CHURN.—D. C. McNeil, M.D., De Witt, Iowa.—This improvement in churns consists in a revolving dasher composed of two paddles, each consisting of two rectangular frames of unequal dimensions, set at right angles to one another upon an axis. A reciprocating motion, imparted by a treadle, operates a crank rotating the axis. The churn box is provided with a semi-cylindrical bottom in which is a faucet to run off the buttermilk. The dashers or paddles, are then removed from the churn and the butter readily removed at a single operation.

WASHBOARD.—Pierre Audauin, New York City.—This invention consists in forming the corrugations or grooves on the washing or rubbing surface of a washboard, at an angle of inclination more or less great to the length of the rubbing surface, whereby the water expressed from the clothes as they are rubbed, is more freely conducted off and down into the tub in which the board is placed.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

Jones.—"I have finally cured my boots of squeaking; not however, as two correspondents recommended, by driving pegs into the soles, as that did no good whatever, but by saturating the soles with woodchuck's oil." We all unite in congratulations. Our friend now steps a softly as a kitten.

J. L. W.—"Correspondents frequently use such words as gum, pitch, turpentine, oil, spirits, etc. These are generic terms; what do they mean when used specifically? If correspondents would be more definite and tell us what kind of gum, pitch, etc., they mean they would make themselves more intelligible to their readers." A good hint.

J. C. B., of Ill.—India-rubber in strips makes a good joint for the glass of an aquarium. The glass and rubber are held together by a rigid frame work of wood or metal.

H. W., of Pa.—The mineral is iron pyrites. It is not likely that you will find a deposit of coal in your neighborhood.

R. G., of Conn.—The best explanation of the hardness of specimens of ancient mortar is its antiquity. Mortars and cements containing silica in favoring circumstances are constantly progressing in improvement. The information which the ancients had about mortars has received important additions in modern times.

S. J., of N. Y.—We are not aware that mellite or honeystone has been found in America. It is a very rare mineral. . . Please send your new method of estimating barium.

A. L., of Pa.—In the Holtz electrical machine, the inductors are pasted on to the spear head insulators, by means of shellac, varnish or gum arabic, and on the side of the spearhead toward the revolving plate.

J. B. U., of Md.—We advise you to get Silliman's Chemistry and Ganot's Physics. In these books you will find the information you seek, fully and plainly set forth.

J. C., of Mo.—Soldering irons or any thing else might be heated by galvanic electricity. The only drawback is that this sort of heat would cost a hundred times more than coal or gas heat.

N. G., of O.—The mixture of oxide and chloride of zinc has been much used by the dentists under the name of artificial bone, osteoplastic and other fanciful names for filling teeth. The objections to it for that purpose are that it contracts on hardening and that it is somewhat soluble in the liquids of the mouth. If the cement were cheap enough it might be extensively used for other purposes.

A. E. S., of N. Y.—You have re-invented the electro-magnetic engine of Dr. Charles G. Page. Such engines have been built on the large scale and are probably as good as any other engine depending upon electricity. In the present state of our knowledge electricity costs too much to be used as a motive power.

D. & P., of Mich., want a cheap preparation to make the shingle roof fire proof of a factory where shavings and saw dust are used as fuel under the boiler. We suggest a trial of a strong solution of chloride of calcium or of magnesium to be occasionally, and especially after rains washed over the roof. These substances are powerful absorbents of water and will keep the roof wet. They are waste products in several large chemical manufactures, where they are thrown away.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

For Sale—Foulds' Automatic Hinge for Window Shutters.—This is the most convenient window-shutter hinge ever invented. There being no danger of breaking hinges and dropping shutters, as is very often the case now. The entire right for sale low, or will sell the Eastern and New England States. Address Cherry & Eckman, Cleveland, Ohio.

Proprietors of Planing Mills having in use a Gray & Wood Planer will please send their address to David R. Miller, 109 Paxton street, Harrisburgh, Pa.

G.M. Danforth & Co., Inventors' Exchange, see advertisement.

New invention. A potato digger which puts the potatoes in a bag and the small ones apart in a box. The original was made by a blacksmith at very little cost, which will be saved by the work on three acres of potatoes. Patent rights to sell: C. G. Grabo. Address care of Schober Bro., Detroit, Mich.

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TOTTEN AND TOPLIFF'S CAN OPENING KNIFE.

It is not improbable that the sale of canned fruits, vegetables, meats, etc., would be largely increased if people generally knew that a handy and efficient implement for opening the cans could be cheaply purchased. The engraving represents such an instrument which by repeated trials we have found to be the "right thing in the right place."

As seen in the engraving it is a simple knife of a peculiar form, having an edged hook at the point. In opening a sardine box or fruit can, the knife is held in a vertical position and the hook pushed through the tin. This requires but little force, a child of seven or eight years easily opening a can of common tin. The knife is then brought gradually down

to a horizontal, the blade being a lever of which the hook is the fulcrum. The knife passes as readily through the tin as an ordinary knife through paper. By repeating the operation a square piece can be cut out of a sardine box, or two cuts may be made on the end of a fruit can, crossing each other at right angles, and the corners then turned back. The knife is equally convenient and handy for paring fruit, or any other purpose for which a kitchen knife is used, as its peculiar adaptation as a can opener does not interfere with these offices.

It was patented through the Scientific American Patent Agency, January 22, 1867, by S. E. Totten and C. L. Topliff. For rights to manufacture address C. L. Topliff, Box 773, New York city.

CALIFORNIA SILK.

From the earliest settlements in this country down to the present time, public attention has at different periods been directed to the subject of silk raising. Indeed, this appears to have been one of the earliest and most successful industries practised in this country, for it is related that silk made from material grown in Virginia was worn by Charles II, at his coronation in 1651. Planting mulbery trees for rearing silkworms was frequently, in the early history of the colonies, made incumbent upon property holders by legislative action, and prior to the Revolution it was considered quite fashionable for ladies to devote their leisure moments to tending silkworms, the cocoon silk being sent to England to be manufactured. The state of Georgia was settled chiefly because its climate was deemed peculiarly suitable for raising silk, and liberal appropriations were made to the colony by Parliament for its encouragement. A rich brocade woven from Georgia silk was worn by Queen Caroline as a court dress. Nor were the Southern states the only ones interested, for each of the older states have at times been extensive silk raisers, but from various causes the industry has finally fallen into disre pute.

Although practically a failure in the Eastern states, this employment seems destined at no distant day to assume importance in the Pacific states, particularly in California. The climate of this favored region is dry, warm, and equable, having all the requisites for success. Our exchanges from that state speak quite favorably of the new adventure and anticipate its developement in time into an important industry. A pioneer in this enterprise is Mr. Louis Prevost, of San José, who has had some previous experience in this line, and who, in his system of treatment has deviated somewhat from the usual manner of raising the worms, introducing improvements whereby time and labor are saved, and consequently increasing the prospects of making the business a paying one.

One of the most marked innovations on the old methods, is feeding with branches of the mulberry trees instead of leaves, a change which seems to work admirably. Sufficient food can now be gathered and distributed to 80,000 hungry worms by only three hours labor per day; then again the trees prosper better by cutting away a portion of the shoots entire instead of partially stripping all the twigs, while the leaves themselves retain their freshness much longer in that warm climate, by remaining attached to the stalk. So dry is the air in San José that remnants of leaves and other offal are soon completely desiccated, so that in a room where 80,000 worms are feeding on trays which are never removed for cleaning, the air is at all times entirely free from smell.

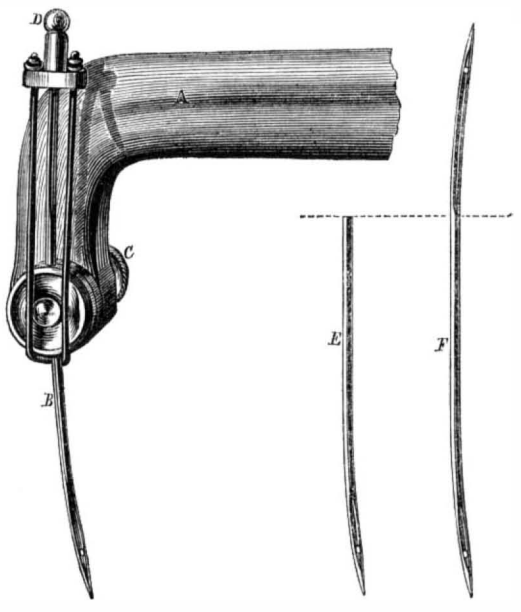
The demand for the worm eggs, both for home use and exportation, is so great that Mr. Prevost decided this year to save no cocoons for silk, but has allowed all the larvæ to undergo the full metamorphosis and pass through the crysalis into the moth state. He estimates his crop as from 12,000,000 to 15,000,000 eggs, and three crops may be raised a season. The French and Italian silk masters do not preserve any larvæ that are not hatched by the fourth day of incubation. Mr. Prevost hatched out all his eggs this year and kept each day's production separate. The first day's crop of worms and the twelfth day's as shown by the results, are equally valuable, the worms last hatched growing to as large a size, and the cocoons being as fine as from those that first left the shell. All these experiments go to show the superior vitality and the healthy condition of California worms over European.

HARRIS' DOUBLE NEEDLE FOR SEWING MACHINES.

Since the advent of sewing machines, and especially since the principles of their construction and operation have been recognized and adopted, much time has been devoted to the perfection of details, generally with beneficial results. The engraving illustrates one of these. It is a double needle, or two needles in one, and was patented by H. A. M. Harris, of Philadelphia, Pa., Aug. 6, 1867.

Its advantages are, economy in stock, by which there is a saving of about one-fourth, and a saving of time in handling, and diminished cost of production. The ordinary manner of making needles is to make two in one piece, and then cut them in half, thus producing single needles. If the length of a single needle is two inches, it requires four inches of steel to make two, while with this improvement it takes only three inches to make a double needle. Of course, so made, there is no need of cutting them in two, and that labor is saved, which with the less handling required, it is believed, will pay for the grinding, drilling, and polishing of the extra point. The inventor claims that if a single needle can be bought for seven cents, one double needle can be sold for ten cents, being a great saving.

The engraving shows the free end of a vibrating arm or needle bar, A, to which the needle, B, is secured on its side by means of a bolt which is set up by a thumb nut, C. A hole for the reception of the needle is made through this bolt behind the head, and the inner face of the head has a semicircular groove as a seat for the needle. To prevent pricking the arm of the operator and to guard the upper point of the needle from injury, a cap, D, of soft metal, as type metal, is



placed over it, and held by a piece of elastic cord as seen in the engraving. E and F show respectively the ordinary single needle and the improved double needle with their relative lengths.

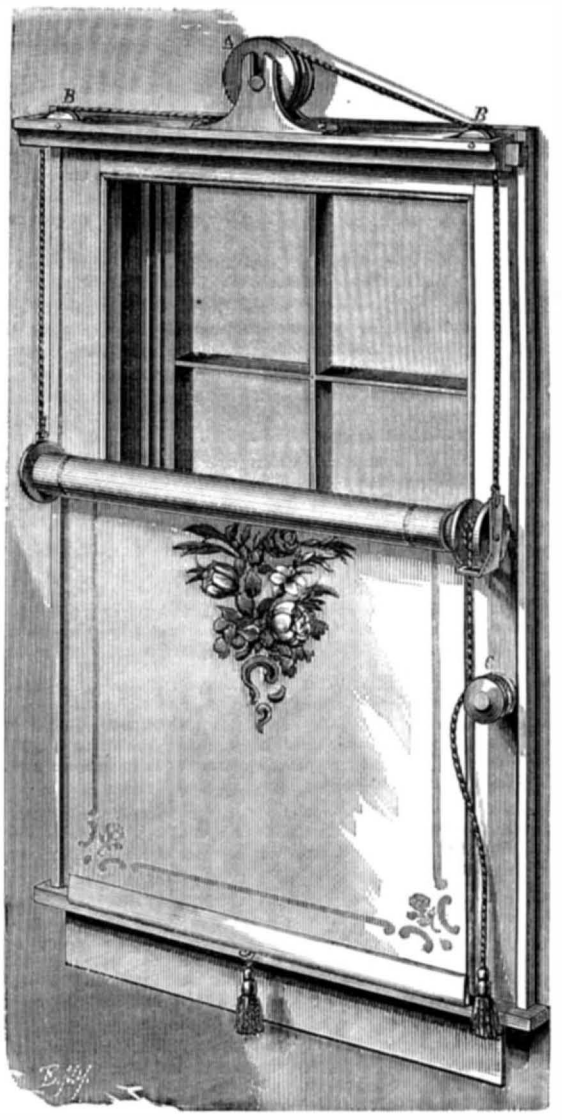
This style of needle can be applied to all machines. It is easily adapted to all which use the curved needle, and those which use the straight needles can be built to use the double needle. The full right is for sale by the patentee, who may be addressed at King's Hotel, West Philadelphia, Pa.

How to Make Good Cement Walks.

Having previously graded and rolled the ground, heat your tar very hot, and with a long-handled dipper begin at one end of a pile of quite coarse gravel, pouring on the tar, quickly shoveling over and over so as to mix thoroughly. Cover the ground two and a half or three inches deep with the tarred gravel and then roll. Clean the roller with a broom as you proceed. Then put on a layer of finer tarred gravel one and a half inches thick, and roll. Then sprinkle the surface with hot tar, spreading the tar with a broom; finally, cover the surface with a light coat of fine sand, and your walk is complete, ready for use. It will improve in hardness by age. Provide portable tar kettles, screens, a roller not very heavy, and tools for systematic work, and you can hardly fail to derive satisfaction.

COX AND HILL'S WINDOW SHADE ATTACHMENT.

The engraving to which this description refers presents a novel method of attaching shades or curtains to windows by which the shades are capable of being rolled or raised either from the bottom, as is the usual way, from the top, or thrown off sideways, so as to uncover any portion of the window, as



may be desired. With these advantages it may be made as ornamental and elegant as any other, and entails but little labor in its construction or fitting up.

Across the top of the window frame there is nailed or screwed a cleat or strip having a dovetail rib; this is a fixture. The whole machinery for moving the shade in any direction belongs and is attached to a bar, of a length corresponding to the width of the window or window frame, which has a groove to receive the dovetail rib. This bar may be an elegant molding in front, and has, on a support on its top at the center a deeply grooved pulley, A, attached to which is a coiled spring, which, when other tension, as that of the hand, is withdrawn, rotates it. Wound in the groove or score of this central pulley are two cords, which lead from the pulley to the ends of the bar, and over pulleys, B, placed therein. Thence they extend to metallic supports of the roller of the shade suspending the curtain. A separate cord is wound about the axis of a pulley, on one end of the roller bar, to be used to actuate the shade, as in ordinary window fixtures. A button or knob, C, may be attached to any convenient portion of the window frame for the purpose of "belaying" or securing the actuating cord.

The operation of this simple device is easily seen. If it is required merely to raise the shade, as is ordinarily done, the hand pulls on the depending cord and the shade is wound up. If the shade is lowered, and it may be desirable to admit the light from the upper portion of the window only, the loop of the tassel at the bottom of the shade is fastened to a hook or button on the window sill, and by pulling on the cord at the side, the upper part of the shade with its roller comes down, as seen in the engraving, when it may be secured in position by winding the actuating cord around the button or knob, C. When the cord is released the coiled spring attached to the pulley, A, will bring the shade up to place. The lateral movement of the shade is easily effected by simply sliding the bar at the window top.

This device was patented through the Scientific American Patent Agency July 30, 1867, by H. J. Cox and Wallace Hill, who may be addressed relative thereto at Long Eddy, Sullivan county, N. Y.

SWISS CARRIAGE ROADS.—There is not in the whole of Switzerland a toll gate. The government forbids by law any thing which may tend to interrupt or interfere with travel in or between the different cantons. The magnificent public roads which one finds everywhere throughout the country are kept in order at the expense of the cantons through which they run, the federal authorities having each paid, however, at the construction, one half of the expense.

THE GREAT CANADA CHEESE manufactured about one year ago at a factory near Ingersoll, is still in a good state of preservation, and is suspended on pivots in the factory, so as to be easily swung over for the gratification of visitors. Thirty-five tuns of milk were used in manufacturing this cheese, which weighs 7,000 pounds.

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VOL. XVII., No. 12....[NEW SERIES.]....*Twenty-first Year.*

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Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Device for Actuating the Shuttle and Needle in Sewing Machines 177
Autumnal Diseases 177
The Exposition 178
American Association for the Advancement of Science 179
The Late Obed Hussey 179
The Petroleum Fuel Mania 179
*Improved Device for Tripping Anchors 180
*Gould's Stopple for Soda-water Bottles 180
*Dynamometers at the Paris Exhibition 180
Watches at the Exposition 180
Chemistry of a Cup of Tea 181
Weather and Mortality Chart 182
Malleable Cast Iron 182
Manufacturing, Mining, and Railroad Items 182
Recent American and Foreign Patents 182
Answers to Correspondents 183
*Totten & Topliff's Can-opening Knife 184
California Silk 184
*Harris' Double Needle for Sewing Machines 184
How to Make Good Cement Walks 184
*Cox & Hill's Window Shade Attachment 184
The Water Supply of London—Decrease of Rain Fall and Pollution of Streams 185
Speed of the 15-inch Shot 185
Progress of the Pneumatic Railroad 185
English Patents 186
Chloro-Iodized Collodion 186
Patent Claims 186, 187, 188, 189, 190

THE WATER SUPPLY OF LONDON---DECREASE OF RAIN FALL, AND POLLUTION OF STREAMS.

The constantly increasing demand of London for water, produced by the yearly augmentation to the population and the extension of manufactures, together with the continually lessening summer flow of the Thames, is a source of grave apprehension to Parliament and the thinking portion of the British Metropolis. Not only is the rapidly increasing demand, and the rapidly decreasing volume of water during the summer months, a source of uneasiness, but the pollution of the Thames and its tributaries by the modern system of sewage causes even greater solicitude. This sewage, the offspring as it is of the extension of population, is an evil, it seems, which, while it cannot be prevented, is capable, by proper engineering, of having its polluting influence so far ameliorated as to be comparatively innocuous.

This subject, of the London water supply, both with regard to maintaining a supply throughout the year adequate to meet the increasing demand as well as to correct the pollution of the streams—the sources of supply—by the contaminating effects of the sewage from the cities near their banks, has been the subject of a very valuable and interesting paper lately read by Mr. Denton before the London Society of Arts.

It is explained, in the first place, that the decrease in the summer volume of flow of the Thames is caused by the fact "that the rain fall is getting positively, though gradually, less in quantity from the disafforesting of the woodland, the improved cultivation of the soil, and the drainage of lands and districts; that although by the drainage of land we gain an increase of water in the winter season, we suffer a diminution in summer." And with respect to the pollution of the streams, that "the sewage of towns is corrupting our rivers and streams in their transit through the country to the sea, proportionally as the sewage of towns extends and the summer flow of rivers becomes less." Thus, while the increase of population and manufactures is rapidly increasing the sewage, the rivers into which this foul sewage is emptied are each summer becoming less and less in volume, and hence the pollution is increasing proportionally as these causes are augmented. This indeed is a state of affairs which we should be very loth to contemplate for our city of New York, and it is a matter which will tax the skill of the English Engineers to the utmost to render the sewage harmless and to maintain an adequate water supply for their metropolis throughout the year.

With respect to the diminution of the rain fall, the following table, prepared by Prof. Austed, and published in the Journal of the Royal Agricultural Society of England, is both interesting and instructive as illustrating the effects of the works of civilization on meteorological phenomena:

Years.	Mean rain fall. Inches.	Mean of 14 years. Inches.
1815—1821	28.7	28·3
1822—1828	27·9	26·1
1829—1835	24·3	24·7
1836—1842	25·1	24·6
1843—1849	24·1	24·0
1850—1856	23·8	23·8
1857—1863	23·7	

On this data Mr. Denton observes, "If we deduce that the rain fall is gradually declining, we cannot reject from consideration the counterbalancing circumstance that land drainage, which is taking place all over the country, discharges into the rivers from the land a *larger* quantity of water than found its way to them before drainage, and more than is actually lost to the rivers by the lessened rain fall." And if the whole of the land which sheds its water into the Thames was wet land, there would be a constant gain in the volume of the river by the extension of the drainage system, but as the wet lands form but a small portion of this surface, and "the water of drainage issuing from our clay lands is not constant, it is, for the most part, discharged in the winter months, when both soil and air are frequently in a state of saturation, and when vegetation is dormant, and ceases to flow in summer, when evaporation is active and the demands for vegetation can hardly be satisfied." Thus the drainage adds to the derangement of the water supply, and the more the drainage is extended and improved, the more, proportionally, will this derangement increase, and "the floods of winter and the droughts of summer" will both increase.

Now there seems to be but one way that the great excess in winter—an excess sometimes so great as to cause serious floods—can be made to balance and supply the deficiency caused by the droughts of summer. This method is to store enough of the winter's surplus to supply the deficiency in summer, and this is the method recommended by Mr. Denton. Of course storehouses for such vast quantities of water means the construction of huge reservoirs, containing enough for two months, or thereabouts, metropolitan supply. This is a plan already being carried out in one of our largest eastern cities, by building a huge reservoir to be filled by the surplus of the season of plenty, to be let into the mains when the lake, from which the supply is drawn, runs low. To show how much in excess the rain fall is over the wants of the population—that is, if it can be collected and made available, it has been calculated, that while the mean average rain fall of the Thames Basin is twenty-six inches, "it only requires three-fourths of an inch of the surplus of winter, from the whole water shed of the Thames, or one and one-half inches from one moiety of the water shed to satisfy the whole population with it." Or, to put the matter more practically, as Mr. Denton remarks, "as it will only be necessary to collect water for six months of the year, one-half an inch of rain, falling on an acre of land, is sufficient to supply two persons with thirty gallons each per diem for six months, and no winter passes by in which there does not run off to the sea, without serving any useful purpose, in excess of the mean summer flow of the river, at least five times the quantity required to meet the supply of the metropolis in the dry times of the summer, when the river cannot fairly part with any portion of its volume; and this or any portion of it may be stored for compensation to the river if reservoirs were properly constructed for the purpose."

It would thus appear that the means necessary to be adopted to maintain an adequate water supply, as regards quantity, are clearly pointed out, and it only remains to free the river water from the pollution of the sewage, to have the supply amply sufficient both as regards quantity and quality. An enormous volume of water is pumped out of the Thames daily by the five water companies; they extract from that river sixty millions of gallons daily, which they have the power to increase to one hundred millions.

It is stated that the flow of the Thames—which should always, it is maintained, be kept at a standard flow of say 450 millions of gallons per diem, is often reduced in dry summers by the pumps of the water companies to 300 to 350 millions. With respect to neutralizing the polluting effects of the constantly increasing sewage, the problem appears to be much more difficult than to store up an adequate supply of water as regards quantity alone. As the summer flow is decreasing and the sewage is continually increasing, both the difficulties and necessities of a correction of this growing evil are apparent.

Rivers, to answer one of the purposes for which it seems nature intended them, must receive the liquid shed into them by the land which they drain, and at the same time supply the population with pure water; but if the river is dirtied by impurities, one of these important objects is at once defeated. And the very small quantity of sewage necessary to render the water unfit for culinary purposes is quite remarkable; it is concluded that "as soon as sewage can be detected by chemical analysis to exist in an appreciable degree in the water we are called on to drink, it is a vital error to use it."

Now, of all the methods proposed for the abstraction of the impurities from sewage, there is only one which scientific men regard as possible to be applied on a scale at all extensive, and that is the distribution of the sewage over land. And even this requires a surface and a proper subsoil, together with the right sort of vegetation to extract and assimilate sufficient of the impurities to render it safe to allow it to mix with water to be used for drinking purposes.

These conclusions, on this point, are thus briefly summed up in the paper alluded to:—

1st. That sewage run over a surface of land which has neither natural or artificial drainage to assist vegetation in retaining the deleterious elements, altogether fails to secure that degree of purity which will allow of its being discharged into rivers from whence may be taken water for drinking purposes, though the operation may serve to clarify and improve its character sufficiently to allow of its being utilized in rivers for navigation and for many other riparian uses.

2d. That land artificially drained to a depth of a few feet, affords, if irrigated, only an imperfect means, in conjunction with vegetation, of separating from sewage its objectionable elements.

3d. That when sewage can be lifted upon high and fertile grounds with a free and porous subsoil, which will admit of its penetration to a considerable depth after it has fed vegetation on the surface, a perfect means of purification may be attained.

The latter plan, which is the only one which thoroughly purifies the sewage, will in most cases require the use of steam engines, pumps, pumping stations, reservoirs, conduits, and other engineering appliances, and a constant outlay for attendance and repairs. It is estimated that it will annually cost some $30,000 to raise the sewage of 250,000 persons 100 feet high and a distance of five miles.

The above remarks and extracts cannot fail to impress upon the reader the extraordinary degree of complication the uses and abuses of progress entail on such an absolutely essential matter as a proper supply of pure water. To maintain life, three wants must be supplied—air, water, and food. Formerly it was only the latter that demanded the sweat of one's brow; but now a supply of pure water not only demands the most skillful engineering talent, but also the expenditure of vast quantities of labor.

SPEED OF THE 15-INCH SHOT.

While Captain Noble and the British artillerists are speculating on the capacity of the 15-inch American cast-iron navy smooth-bore cannon, with a velocity of shot less than 1,200 feet per second, we on this side of the Atlantic are wondering why they do not indulge in a little mathematics with respect to the effect of the 453-lb. ball at higher velocities. Are they afraid to "penetrate" "rack" or to produce a tremendous "non-local effect" on their targets—the representatives of the strength of the British navy—even on paper?

Fifteen hundred feet is a common velocity with our 453-lb balls: it is given in the text book on ordnance used by the military schools all over the country, where the American idea is taught how to shoot.

And while Capt. Noble, the eminent ordnance mathematician of Her Majesty's service is astonishing his brethren and tickling the patentees of small-bore ordnance and the small-bore members of Parliament, by his skill in holding the 15-inch ball down to a velocity of less than 1,200 feet per second, with a harness of algebra, and the power "per circular inch" down to a certain number of "foot tuns," our farmer boys are using a school book which shows that the ball goes some 1,500 feet per second. That is, as the square of 1,170 is 1,368,900, and the square of 1,500 is 2,250 000, about 63 per cent more *vis viva* than this mathematical gymnast thinks to be possible.

The following extracts from Benton's text book on Ordnance speak for themselves and illustrate our meaning:

The navy 15-inch trial gun was fired 900 times with charges varying from 35 to 70 lbs., mostly mortar or navy cannon powder . . . Our army 15-inch gun has been fired without injury 250 times with charges varying from 40 to 100 lbs. of mammoth powder—the same that was used in England in trials against the target. One hundred of these rounds were with 100 lbs. of powder and spherical projectiles of 450 lbs. each. 15-inch gun No. 105 has likewise been fired as follows, namely:

No. of times fired.	Charge.	Weight of ball.	Velocity.
2	60 lbs.	430 lbs.	1191 feet.
3	70 lbs.	431 lbs.	1278 feet.
3	80 lbs.	433 lbs.	1355 feet.
3	90 lbs.	452 lbs.	1433 feet.
2	100 lbs.	453 lbs.	1509 feet.

Now, ye artillerists of Shoeburyness, the next time you project a 15-inch ball against your 8-inch solid slab backed by 18 inches of teak and a thin iron skin, or even against your much vaunted "Hercules" target, be sure and put plenty of powder behind it. We are not particular about the kind, no matter whether it is English, Dutch, French, or Japanese, only make sure to put in sufficient to drive the ball at least 1,500 feet per second.

At the late trials with the 15-inch at Shoeburyness, according to the official statements published in the scientific journals, it was demonstrated that 50 lbs. of the English powder was equal to 60 lbs. of the mammoth grain imported from America, hence, according to this ratio it will require 83⅓ lbs. of the Shoeburyness powder to equal 100 lbs. of the mammoth grain. So if it is the intention of the English trials to find out the real power of the gun, that is the charge which should be employed; and in order that the trial may be comparative, the gun should be exactly the same distance from the target that it was on the trial already made.

Waive your excessive delicacy just once; do not be afraid of bursting the big cast-iron smooth-bore. But it is not so much the success of this lump of cast iron that we are interested in, as it is in the pleasure of witnessing the demolition of the absurd small-bore system on which you have wasted millions. The English ordnance engineer started with a loud blowing of trumpets years ago to build 13·2-inch wrought-iron Armstrong rifles, but finding they were no go, these gun-makers were driven to smaller calibers, hence the arguments of their mathematicians to prove them to be the best.

We are willing to hazard the prediction that before long the British small-bore system of naval ordnance will be as completely smashed, as the "reputation of Sir William G. Armstrong, the whilom great "rifle engineer."

With respect to the character of the metal best adapted for projectiles for iron-clad warfare, it will not, we think, be denied but that the invention—or discovery—of the advantage, of chilled cast-iron shot for the penetration of armor, is as applicable and adds as much to the efficiency of smooth-bore ordnance as it does to the rifle.

Therefore, on the trials to which we have alluded, any advantage which the nine-inch rifle may have had over the big smooth-bore, owing to the peculiar character of the iron its shot was made of, or in the method of casting it, it is not an advantage in any way whatever due to the gun itself. And it is quite clear that, in order to make a fair test, each gun should be fired with the best projectile known, capable of being used in the gun. In other words, no advantage should be permitted of one gun over the other, except such advantages as are due solely to the piece itself, such as strength, caliber, and method of rifling.

PROGRESS OF THE PNEUMATIC RAILROAD.

The first practical example of the Pneumatic Railroad ever constructed in this country has just been completed by the Holske Machine Company, No. 528 Water street, and will

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form one of the prominent features at the exhibition of the American Institute in this city, now just opening. The pneumatic tube is six feet in diameter, composed of fifteen thicknesses of wood veneers, wound and cemented one upon the other in alternate spirals. This makes a tube of remarkable strength and rigidity, although the total thickness of wood is only an inch and a quarter. This tube is made under J. K. Mayo's patent. The blowing apparatus consists of a wheel 10 feet in diameter, made on the principle of a screw propeller. The pneumatic car consists of an open vehicle with a valve or disk at one end, which fits the tube. The car seats twelve passengers. The tube is over 100 feet long.

Messrs. Holske have also built a Pneumatic Postal Dispatch for the exhibition. It consists of a pneumatic tube 24 feet in length and two feet square, having a lamp-post letter-box arrangement upon it, and a pneumatic car within. The construction is such that when the car, which is driven by air pressure, passes through the tube, it collects the letters from the lamp-post. The intention is to lay down these tubes through the city for the speedy collection and delivery of postal matter.

The above railroad and postal devices are made from designs by Mr. A. E. Beach, of the SCIENTIFIC AMERICAN, and their practical operation will be more fully described hereafter.

English Patents.

The Lord Chancellor, the Master of the Rolls, and the late and the present Attorney-General (the latter then Solicitor-General), as commissioners of patents, report that 2,124 patents were passed in the year 1866. The amount received in the year for stamp duties, the fees being now paid by means of stamps, was £114,461, which was more than double the expenditure of the department, though this must have been upon a liberal scale, if we may judge from the first item, £9,428, paid in fees to the Attorney-General and the Solicitor-General, and £856 to their clerks. The receipts included £31,400 for continuing old patents beyond the first three years of their term of fourteen years, and £21,900 for continuing old patents beyond the first seven years of their term. The fee of £50 for continuing a patent beyond its third year is paid on about 30 per cent. of the patents issued, and the other 70 per cent. become void at the end of three years. The further sum of £100, payable at the end of the seventh year is paid on about 10 per cent. of the patents issued, so that 90 per cent. are allowed to become void at the end of the seventh year.

Chloro-Iodized Collodion.

A friend of ours is working entirely, both in the gallery and the field, with chloro-iodized collodion; the results are excellent; we are inclined to believe they are better than can be obtained with a bromo-iodized collodion. Our own experience with a similar collodion is equally satisfactory; we get more detail and better work in general with the chloro-iodized than with the bromo-iodized collodion.

Formula.—Alcohol, 4 ounces; ether, 4 ounces; pyroxyline, 48 grains (more or less); iodide of ammonium, 40 grains; chloride of ammonium or magnesium, 8 grains.

Chloride of magnesium is more easily soluble in alcohol and ether, and therefore preferable. Our friend has 24 grains of chloride of ammonium in this quantity of collodion, but we are certain so much will not dissolve.—*Humphrey's Journal.*

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING SEPTEMBER 3, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

68,334.—DOOR LOCK.—E. Allen and J. Brady, Norwich, Ct.

1st, The combination of the two opposite sets of tumblers, the key, I, notched on both sides or edges, and the cam, D, applied to operate simultaneously on both sets of tumblers, substantially as and for the purpose specified.

2d, The cam, D, constructed with teeth, g, the sliding frame furnished with bolts, G, and spurs, h, and the two opposite sets of tumblers, arranged to operate in relation with each other and with the key, I, springs, c, and stop, n, substantially as and for the purpose specified.

68,335.—MODE OF PREPARING TAN BARK FOR USE.—Alexander Appleby, Brownfield, Me.

I claim bark prepared by being rendered flexible and flattened and reduced by means substantially as described; and furthermore,

I claim the proces as hereinbefore specified for preparing bark for transportation and use as explained, such consisting in rendering the bark soft and flexible, by moisture or steam, and next flattening it and removing from it the ross, by means as set forth or the equivalent thereof.

68,336.—RIG FOR SLOOPS AND SCHOONERS.—John Atwood, Jr., Provincetown, Mass.

1st, I claim in combination with the stationary mast, A, the secondary or additional mast, B, when the latter is so arranged as to be capable of being firmly fixed to the deck and form a support to the stationary mast, or of being raised so as to form a continuation of the said stationary mast, as and for the purpose specified.

2d, I claim in combination with the secondary mast, B, the guides, a a, the eyes, b, and crosstree, c, as described.

68,337.—ROTARY ENGINE.—Wm. Atwood, Cape Elizabeth, Me.

1st, I claim the construction of the chamber, having inclined and horizontal portions on the interior faces of the cylinder heads, as and for the purposes described.

2d, The rotary piston, D, with its slots and alternating wings, E, as and for the purposes described.

3d, In combination with the cylinder chamber, the rotary piston and alternating wings, the arrangement of the four ports of the cylinder, substantially as and for the purposes described.

68,338.—KEY FOR LOCKS.—A. G. Batchelder, Lowell, Mass.

I claim the key, A, as made with the notch, a, arranged in its shank, and with respect to its bit, c, substantially in manner and for the purpose as specified.

68,339.—BUSINESS CARD AND PIN CUSHION.—De Witt C. Beamer (assignor to himself and James Markland), Philadelphia, Pa.

1st, I claim a combined hermetically sealed, scented, perfumed business card and pin cushion, constructed substantially as above described and for the purposes set forth.

2d, The combination of the piece of lapping, B with the board, A, and strips, E E, the lapping having a hole, a', for the reception of a perfume material, and arranged substantially as described and for the purposes set forth.

68,340.—BENDING MACHINE.—L. H. Beckwith, Port Jervis, N. Y., assignor to himself, M. Colgan, Port Jervis; and M. M. Livingston, New York city.

1st, I claim a forming lever, in combination with a holding box and former, the whole constructed and arranged substantially as described, and having a mode of operation substantially as set forth.

2d, The combination of the set screws, D I, and stops, F s, with the holding boxes, substantially as and for the purpose herein specified.

3d, The cam shaped clamp, C, in combination with the holding box, B, and adjustable stop, s, substantially as specified, for holding the bar or rod in the holding box while being operated upon.

68,341.—STRAP ATTACHMENT.—Alma Bedford, Coldwater, Mich.

I claim an improved fastening device consisting of a clamping plate made concave or with an upturned edge, combined by means of a central independent screw, with an opposite plate of smaller diameter or demension, the whole arranged and operating substantially in the manner and for the purpose herein set forth.

68,342.—MACHINE FOR FRAMING MATCH SPLINTS.—Jacob Bentz, Brooklyn, N. Y.

1st, I claim the employment of a splint clamp feeding device arranged to work in connection with the machine for framing and filling the splint clamp with splints, substantially as and for the purpose herein shown.

2d, The employment of the cams, S S, the levers, R R, and connecting rods, T T, for the purpose of automatically operating the said feeding device with the operation of framing and filling of the splint frames, substantially as herein shown.

3d, The employment of the slot, U, in connection with the grooved bed, C, and hopper, B, and plungers or comb, E, substantially as and for the purpose herein described.

68,343.—STRAW SCATTERER.—Montgomery Blair, Barry, Ill.

I claim the foregoing described machine with its combination of pulleys, rollers, and revolving rakes, and stop rakes, all moved by means of bands and pulley attached to common wagons.

68,344.—MANUFACTURE OF HOSE.—Glaucus H. Bonnaffon, Allagheny City, Pa.

I claim strengthening hose or belting by plates or straps of metal, or other suitable material, connected with the riveting in the folded edges, which plates or straps are also riveted to the hose or belting at points laterally back from the main riveting, substantially as and for the purposes above set forth.

68,345.—PREPARING SHORT CUT STRAW FOR FEED.—Charles Brown, Buffalo, N. Y.

I claim preparing short cut hay and straw, by crushing and winnowing to produce an improved article of food for cattle and horses, substantially as described.

68,346.—MACHINE FOR REMOVING THE SEED FROM BROOM CORN.—James D. Brown, Preble County, Ohio.

I claim the wheel, B, provided with teeth or spikes, b b, and the chute, D, arranged and in combination with the whole substantantially as herein set forth and for the purpose specified.

68,347.—RAILWAY CAR SEAT.—Justus A. Brown, Bath, Me.

1st, I claim the reciprocating arm, C C, pivoted to the seat, A, with the bar, g, connected to their lower ends, and having the back, B, pivoted to their upper ends, which is provided with pin, c, playing into the slot, d, of the back, as represented and described.

2d, The pin, c, in combination with the back, B, operating with the slotted arms, C, pivoted to the seat frame, substantially as described for the purpose specified.

68,348.—HOSE COUPLING.—John R. Buchanan, Chicago, Ill.

I claim the combination and arrangement of nut, D, barrel thimble, B, and hose, C, arranged to operate substantially as and for the purpose set forth.

68,349.—BUOY SAFE.—F. O. Buisson, Nantiat, France.

I claim a buoy safe composed of a metallic buoy made up of separate compartments provided with lids or doors and outside cork armor, substantially as specified.

68,350.—APPARATUS FOR TESTING DEEP WELLS.—T. Burr and T. Wakelee, Battle Creek, Mich.

1st, We claim the packing boxes, B B C C C2 C2, constructed and operating substantially as described and for the purpose set forth.

2d, The gas pipe, D, in connection with the packing band, substantially as and for the purpose set forth.

3d, The lever, I, in combination with the connecting rods, G G, brake, E, extension rods, F F, and packing bands, B B C C C2 C2, substantially as described and for the purpose set forth.

68,351.—APPARATUS FOR COATING METAL PLATES WITH TIN AND OTHER METALS.—H. W. Butterworth, Philadelphia, Pa.

1st, I claim rollers, a and a', combined with a pan for containing molten lead, substantially as and for the purpose herein set forth.

2d, The pan, B, in combination with the rollers, a and a' and b and b', geared together so as to operate together substantially as described for the purpose specified.

3d, The arrangement of the curved apron, b2, in the bottom of the pan, B, in respect to the rollers, a and a' and b and b'.

68,352.—GRAIN FORK.—Abram Clow (assignor to himself and Charles Clow), Port Byron, N. Y.

1st, I claim the arrangement of the sockets, a' and C, placed in line, so that in seating the center tooth, B', it must be driven through both sockets, as herein described and for the purpose specified.

2d, Also the elevated rests or supports, f f, for steadying and stiffening the bow, D, substantially as and for the purpose specified.

68,353.—WINDOW VENTILATOR.—Samuel Darling, Bangor, Me.

1st, I claim combining with an ordinary window sash a ventilating device inserted in the sash itself, substantially as described.

2d, In combination with a ventillating device substantially such as described, openings or perforations in the sash inclining downward and outward.

3d, In combination with double sashes, one or more ventilating tubes inserted therein and provided with a valve, substantially as described.

68,354.—CHURN DASHER.—Geo. H. Dow, Freeport, Ill.

I claim the valve seat, D, and valve, D', in combination with the dasher, B, and shaft, A, when constructed as and for the purpose set forth.

68,355.—CLOTHES DRYER AND STAND.—W. H. Earnest, Parkersburg, W. Va.

I claim the revolving head, C, flat at its top and with a circumferential groove on its edge, around which is passed the wire, E, having a series of arms, D, suspended by means of narrow slots at their inner ends, said arms being grooved at their sides and beveled on their upper edges, the whole supported by the stand, A, as specified.

68,356.—CENTRIFUGAL MACHINE FOR WASHING SUGAR.—George E. Evans, Boston, Mass.

1st, I claim a removable cone for forming a wall of sugar in centrifugal machines constructed and operated substantially as described.

2d, In centrifugal machine for washing sugars, I claim operating a removable cone placed within such centrifugals by lifting it while the centrifugal is being revolved for the purpose of forming a wall of sugar, in the manner and for the purpose substantially as described.

68,357.—MACHINE FOR SEPARATING TINNED AND GALVANIZED ARTICLES OF METAL.—Herbert E. Fowler, Waicottville, Conn.

I claim the vibrating separator, fitted substantially as specified, in combination with the supply hopper, as and for the purposes set forth.

68,358.—COW MILKER.—George H. Gardner (assignor to himself and A. B. Cooley), Philadelphia, Pa.

1st, I claim the combination with the vessel, A, of a piston, B, its rod, d, and the operating lever, C', the whole being constructed, arranged, and operating substantially as set forth for the purpose specified.

2d, The branch pipes, D, rendered adjustable on the vessel, A, substantially as and for the purpose herein set forth.

3d, The adjustable teat cups, G, strengthened by the rings, v v1 and v2, substantially in the manner described.

4th, The manner substantially as described of securing teat cups, G, to the branch pipes.

68,359.—AMALGAMATOR.—H. A. Gaston, Nevada City, Cal.

1st, I claim the dies, E, in the bottom of the pan, constructed and operating in combination with mullers, A, essentially as described.

2d, The mullers, A, when constructed of a spiral form, whereby they are made to spread or grind the pulp when rotated in one direction and to loosen it from the bottom when rotated in the opposite direction, substantially as described.

68,360.—METHOD OF HOLDING WHIPS.—John Gibson, Jr., Albany, N. Y.

1st, I claim constructing whips with a hollow butt or handle end, for the purpose substantially as set forth and described.

2d, I claim the standard, C, with or without the elastic washer, e, or its equivalent, attached to the body, dickey seat, dash, or any other part of the carriage or sleigh, for the purposes set forth and described.

3d, The hollow or bore, a, of the whip handle, in combination with the standard, C, for holding the whip, substantially as set forth and described.

68,361.—BUTTENER FOR SHOES.—John F. Goldthwait, Boston, Mass.

I claim a buttoner substantially as described, consisting of a continuous loop, enlarged at C, for the purpose of receiving the button, and narrowed at d, to suit the eye of the button.

68,362.—DRILLING MACHINE.—Wm. D. Grimshaw, Newark, N. J. Antedated Aug. 18, 1867.

1st, I claim the sides, t, clamped to the standard, b, and receiving the bed, u, constructed and arranged in the manner and for the purposes specified.

2d, I claim the pulleys, d r and s, arranged as set forth, in combination with the drill stock, k, treadle, g, and crank, 2, as and for the purposes specified.

68,363.—PREPARING AND TREATING VEGETABLE FIBERS.—Charles Heaton, New York city.

1st, I claim subjecting crude vegetable fibrous material to any chemical treatment which softens and shrinks its bulk without disintegrating the same, for the purpose set forth and described.

2d, Preparing bamboo or other crude vegetable fibrous matter for transportation and subsequent disintegration as a fiber-producing material, by means of an alkaline or a caustic alkaline solution.

3d, Softening and preparing bamboo, or other crude vegetable fibrous matter, by means of an alkaline solution, when so applied as not to disintegrate the material, but simply to prepare it for mechanical reduction, as fully set forth.

4th, The process of disintegrating bamboo or other like crude vegetable fibrous matter, by means of the beating or rag engine or its mechanical equivalent, when such bamboo or other fibrous matter has not been reduced to a pulpy mass by chemical action or when the material has not been previously subjected to a treatment which destroys its woody conformation, but has been prepared for the mechanical disintegration by being softened in an alkaline solution.

68,364.—BOOT HEEL.—John Hubbell, Buffalo, N. Y. Antedated Aug. 25, 1867.

I claim extending the metallic heel plate upwardly sufficient to meet the upper leather, as represented at a3, and making the front part concave as shown at a4, for the purpose and as described.

68,365.—ROLLING RUBBER INTO SHEETS AND APPLYING THE SAME TO FABRICS.—David C. Hull, Chelsea, Mass.

I claim the improvement in the manufacture of sheets of rubber by means of rollers, the same consisting in the formation of two separate sheets, by two pairs of reducing rollers, and subsequently bringing together and uniting the two sheets so made by means of two rollers and by the pressure of such sheets between such rollers, as specified.

I also claim the new manufacture or compound rubber sheet as made by such process or means.

I also claim the duplex or compound rubber sheet making machine, as composed of the two pairs of reducing rollers, B C and D E, and one or more compressing rollers, F, the whole being to operate substantially as and for the purpose described.

I also claim the above described improvement in the application of rubber to cloth by means of rollers, the same consisting in the formation of two separate sheets of rubber by two separate sets of reducing rollers and applying and pressing by means of two rollers, such two sheets together and upon a single piece of cloth or upon two pieces of cloth, so as to unite the sheets and cloth in manner as specified.

I also claim the new manufacture or compound rubber coated cloth or its equivalent, made by means and in the manner specified.

68,366.—COOKING RANGE.—M. C. Hull, New York City.

1st, I claim in a range or stove provided with an elevated oven, a descending flue in the lower portion of the range, for the purpose and substantially as set forth.

2d, I claim the arrangement of the air pipe, k, smoke flue, n, and elevated ovens, o, o', in combination with a range or stove having a descending flue, substantially as and for the purpose set forth.

3d, I claim a conical register introduced in the hot air flue around the smoke flue, in the manner and for the purposes specified.

4th, I claim forming a chamber, for non-conducting material, above the top oven flue, for the purposes and as set forth.

5th, I claim inclining the upper plate of the top oven flue, so as to deflect the products of combustion down upon the top of the oven as set forth.

6th, I claim the air flue, k, within the smoke flue, n, in combination with an air heating range or stove, substantially as set forth.

68,367.—DRYING OILS FOR PAINTS.—Fleury Huot, N. Y. City.

I claim the manufacture of drying oils having a body adapted to paint, &c,. by the acid reaction in the manner specified.

68,368.—CAR SEATS AND COUCHES.—Isaac W. Lamb, Salem, Michigan.

1st, I claim the backs, B, hinged to the seats and connected by rods to upper movable berths, constructed and arranged as described.

2d, The arms, b, b', in combination with the movable backs, as and for the purpose set forth.

3d, In combination with the arm, b, b', and backs, I claim the arrangement of cords, rollers and pulleys, for the purpose set forth.

4th, I claim the stops, o, o', in combination with the seat frame and arms, b, b'.

5th, I claim the upper couches, D, D', attached to the seat backs by long and short rods, all constructed and arranged as described and for the purpose set forth.

6th, In combination with the upper couches, supported and operated as described, I claim curtains, c, e, as and for the purpose set forth.

68,369.—HORSE COLLARS.—William Leonard, Boston, Mass.

I claim a horse collar, the bearing surface of which is made of rubber compound, when the edges of such rubber are reinforced to enable the rubber to be secured in position, substantially as set forth.

Also, in combination with the above, I claim interposing between the rubber and the stuffing, c, the cloth, h, substantially as and for the purpose described.

68,370.—PAPER STOCK.—Heman S. Lucas, Chester, Mass.

I claim the application of the fibres of the stalks and leaves of the plant *Spartina Juncea*, (or low Rush Salt Grass,) to the manufacture of paper stock.

68,371.—PLATFORM SCALES.—C. C. Lyman, Edinboro, Pa.

I claim the cams, G, shaft, D, and pulleys, H, as arranged in combination with the platform, B, for the purpose and in the manner set forth.

68,372.—CATTLE STANCHIONS.—Chas. H. Mann, Fairlee, Vt.

I claim the rotary stanchion, as well as its arrangement and combination with a holding frame or its equivalent, the whole being substantially as described.

68,373.—SOFA BEDSTEAD.—Chas. F. Martine, Boston, Mass.

1st, I claim the spring catch, a, and pin, e, in the stationary section, D, and the notched opening in the hinged section, C, of the arm for securing said sections together as and for the purpose specified.

2d, The latches, G G, pivoted to the back, L, and used in combination with the staples or loops, I, I, and cord, J, for disengaging both ends of the back simultaneously, substantially as specified.

68,374.—MACHINE FOR STIRRING STARCH.—Purdy Mason and James W. Brant, Oswego, N. Y.

1st, We claim the tank, A, with its glass stave or window, as and for the purpose set forth.

2d, The use of the adjustable gates, G. G, with their weights and cords for regulating them, substantially as herein set forth.

3d, The combination and arrangement of the tank, A, and shaft, D, with its arms with the sleeves, H, H, cords, J, J, and gates, G, G, as and for the purpose specified.

68,375.—APPARATUS FOR THE MANUFACTURE OF SODA WATER AND FOR AERATING LIQUIDS.—John Mathews, Jr., New York, City.

1st, I claim a soda-water or other aerating apparatus, having its pump feed and agitator or mixer, so arranged in relation to its condenser or reservoir as that all joints in the latter above its average water level may be dispensed with as herein specified.

2d, In soda-water or other aerating apparatus the combination with the reservoir or condenser, C, a reciprocating discharge pipe or tube, J, to the pump, substantially as and for the purposes herein set forth.

3d, The combination of the stationary hollow plunger, D, reciprocating pump cylinder, F, reciprocating discharge pipe, J, connected therewith, receiving and delivery valves, and reservoir or condenser, C, essentially as specified.

4th, The volutes, L, M, or their equivalents, acting as agitators or mixers, arranged on the reciprocating pump discharge pipe, where it projects into the reservoir, C, or otherwise similarly driven for action therein, as set forth.

5th, The combination with the pump for direct action thereby of an agitator or agitators within the condenser.

68,376.—GATES.—Isaac H. McOmber, El Paso, Ill.

I claim the block, G, roller, H, staple, C, and bolt, D, shaft, E, and spring, F, constructed and arranged to operate as and for the purpose set forth.

68,377.—STEAM ENGINE.—Cyrus H. Merrick, Pittsburg, Pa.

1st, I claim so constructing the steam valves and ports of the cylinder of a reciprocating engine as to open a communication for exhaust steam between the two ends of the cylinder at or about the time when the live steam is cut off and before the completion of either stroke, substantially as and for the purposes above set forth.

2d, Balancing the piston of a reciprocating engine by the use of exhaust steam or other fluid motor employed while the crank is approaching to, passing and receeding from the dead points or centers, during any desirable portion of the stroke, substantially as and for the purpose above described.

3d, So constructing and arranging the steam valve and ports of a steam engine as to admit steam to cylinder during the middle of each stroke, and for a greater or less proportion of such stroke, in combination with one or more openings or communicating passages from end to end of the cylinder fitted with a valve or valves or other suitable device for permitting or preventing the flow of stream, in order to balance the piston, substantially in the manner and for the purposes hereinbefore set forth.

68,378.—WASHING MACHINE.—Lewis Merrifield, Lagrange Center, Ind.

I claim the combination and arrangement of the frame, D, grooved rollers, B B, rubber, K, tub, H, with the springs and catches, E, all as and for the purpose specified.

68,379.—CURBING.—Jeremiah Miller, Pittsburg, Pa.

I claim a metallic curbing or metallic base for railings fences and similar purposes consisting of a cap or crown piece, web, flange and gutter constructed substantially as and for the purposes described.

68,380.—HOSE COUPLING.—Peter H. Niles, Boston, Mass., assignor to himself and Agustus Russ, Cambridge, Mass.

1st, I claim the construction of a self-packing coupling composed of an elastic ring expanded into a recess in the opposite section of the coupling by means substantially as described.

2d, I claim the expanding ring, D, in conformation with the recess, G, forming a self-packing coupling substantially as above described.

3d, I claim the ring, D, nut, B, washer, C, and flange, E, acting in combination substantially as above described.

68,381.—WOOD SCREWS.—Richard J. Nunn, Savannah, Ga.

1st, I claim the nails or locking brads, b, in combination with the screw having its head constructed with nicks or notches, a', substantially as and for the purpose herein set forth.

2d, The supplemental head, c, in combination with the locking brads, b, and the notched head of the screw, substantially as and for the purpose herein set forth.

68,382.—CONDENSER.—Frederick Ortlieb, Williamsburg, N. Y.

1st, I claim the outer siphonic pipe through which the water from the condenser flows for extracting the air and gases from the steam condensing spaces through a pipe or pipes communicating therewith essentially as set forth.

2d, The combination of the water circulating or siphonic pipe, C, with the pipe, D, or its extension, D', made adjustable so as to regulate the outflow through the pipe, C, for operation in connection with the condenser substantially as specified.

68,383.—LINING IN STOVES.—Austin Packard, Brooklyn, N. Y.

I claim fastening or securing fire brick or soap stone lining in the fire boxes or fire pots of stoves, ranges, cabooses or in other places where such linings are or may be used substantially as hereinbefore set forth.

68,384.—CANNING FRUIT.—C. J. Paine, Young America, Ill.

1st I claim the improved mode herein described for canning fruit, etc., by means of steam introduced into the body of the fruit, etc., whilst the same is in a cold state, substantially as set forth.

2d, I claim the special use of the pipe, C, provided with the pertorations. E, and operating in the manner and for the purpose substantially of specified.

3d, The filler or funnel, D, provided with the collar, D', in combination with the pipe, C, and operating so as to be adjusted to any night can or jar, in the manner substantially as herein set forth.

4th, The combination of the pipe, C, filler, D, provided with the collar D', and boiler, A, arranged and operating as and for the purpose specified.

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68,385.—APPARATUS FOR SLABBING SOAP.—Harvey and Alvah Phelps, Albany N. Y.

1st, We claim the employment or use of the attachable and detachable frames, F, constructed as described and the same secured to the movable frame, E, by means of the clamps, H H, or their equivalents for the purpose specified.

2d, We claim in combination with the frames, E F, and clamps, H, the windlass, A, frame, B, guide bars, d d, and sliding bars, c c, the whole being arranged to operate in the manner and for the purpose shown and described.

68,386.—COTTON ELEVATOR.—William Potter and Ebenezer Crane, Lowel, Mass.

1st, We claim the employment of the endless aprons in the manner and for the purpose substantially as set forth.

2d, We claim the employment of points, o, projecting from the apron slats, as and for the purpose set forth.

3d, We claim the binder rolls, c, combined with the apron, B or C, as and for the purpose specified.

68,387.—WINDOW SHUTTER FASTENING.—Ralph Reed, Pittsburg, Pa.

I claim the bar, C, constructed and used with the window shutter and sill, substantially as and for the purpose set forth.

68,388.—PIPE JOINTS.—John H. Rhodes, Brooklyn, N. Y.

I claim the combination of the slip sleeve, B, made of an arched or bulging from between its ends of soft metal or other suitable compressible material, with a compressing jacket or clamping rings, C C', of a harder or less pliable character, for operation in connection with the ends of separate lengths or sections of pipe, A A', substantially as specified.

68,389.—SOFA BEDSTEAD.—L. Schaefer, Cleveland, Ohio.

I claim the adjustable arms, F, dowel pins, G, and movable back, H, when constructed and arranged in combination with the sections, A B, in the manner substantially as described.

68,390.—THRASHING MACHINE.—W. J. Sloan, Bloom, Ill.

I claim a feeder having frame, A, guards, E, and endless apron, B, in combination with cylinder, H, having curved arms, I, when constructed substantially as and for the purpose set forth.

68.391.—STAGING.—Seabury Sowle, New Albany, Ind.

I claim the within described skid constructed and used substantially in the manner and for the purpose set forth.

68,392.—POTATO PLOW.—J. P. Stanton, Fredericktown, N. J.

1st, I claim the employment of a hand lever for shifting laterally the side ploughs, substantially as described.

2d, I claim such lever combined with devices for locking the same in different positions.

3d, I claim such lever combined with a slide connected with the side plow beams.

4th, I claim such lever combined with a side spring operating as a self-acting locking device.

68,393.—CULTIVATOR PLOW.—W. H. Startzman, Big Lick, Va.

I claim the arrangement with the beam, A, and shank, B, of the stirrup, C, set screw, E, brace, F, bolt, H', and the teeth, G, made reversible with the same or different shaped ends, as and for the purpose set forth.

68,394.—MILL PICK.—W. B. Stephens, Stephen's Mills, N. Y.

I claim the combination and arrangement of the bars, A A', steel plate, B, and set screw, C, when constructed and used for the purposes specified.

68,395.—CARRIAGE JACK.—O. B. Sutton, Kensico, N. Y.

I claim the notched locking bar, D, pivoted to the leg, B, its upper face bearing against the staple, E, secured to the leg, A, and retaining on its lower face the link, F, attached to the lifting bar, C, which is pivoted to the two legs, A and B, operating substantially as described for the purpose specified.

68,396.—BRICK MACHINE.—Lewis Sylvester, Philadelphia, Pa.

1st, I claim the combination of the reciprocating mold box, its compartments and followers, the box, G, and its partitions, h, and the reciprocating ram with its recesses for the reception of the said partition the whole being constructed and arranged substantially as and for the purpose herein set forth.

2d, The combination of the above with the hopper, G.

3d, The pin or key, d, for connecting the ram, F, to the rod, E, in combination with the devices herein described, or the equivalents to the same whereby the ram and rod may be made a fixed part of each other or may be made to move to a limited extent independently of each other for the purpose specified.

4th, The mold box, follower, r, their rods, r', and plate, L, in combination with the arms, P, and the appliances herein described or their equivalents whereby the said arms are caused to yield on forcing the clay into the compartments of the said box, are carried upwards with the box and are made the medium of forcing the bricks from the box, all substantially as set forth.

5th, The bearing off boards, i, constructed and applied to a brick machine substantially as described, so as to serve as a medium for stripping the bricks from the followers as set forth.

6th. A steam pipe, l, communicating with the compartments, x, of the box, G, substantially as and for the purpose herein set forth.

68,397.—WHEEL HUB.—B. F. Taft, Groton Junction, Mass., assignor to Ames Plow Company, Boston, Mass.

I claim the combination as well as the arrangement of the series of lips, or bridges, c c, the cap plate, C, and the hub part, A, provided with the sleeve, B, and the spoke receiving cavities or mortises arranged within it and with respect to the said lips substantially in manner as heretofore specified and as represented in the accompanying drawings.

68,398.—OVER SHOES.—H. G. Tyer, Andover, Mass.

I claim the new process described of making a vulcanized shoe with an elastic gore, the same consisting in the insertion within the shoe during the construction of it and prior to vulcanization of it, of muslin, stocking net, or other equivalent fabric, (however such fabric may have been prepared,) in connection with vulcanizable India rubber or India rubber compounds, placed on or between layers of the said fabric, and to a removal of part of the shoe lining, the whole being substantially as hereinbefore set forth.

68,399.—SELF-RELIEVING GRAPE GATHERER.—Calvin Wadsworth, Madison, Ohio.

I claim as a new article of manufacture the divided basket or receptacle herein described, consisting of the hinged halves, A A', and hasp, D, arranged so as to operate in the manner and for the purposes specified.

68,400.—MILK BUCKET AND STRAINER.—D. N. West, Smithsburg, Md., assignor to himself and J. Mong Hughes, Greencastle, Pa.

In combination with a bucket, can or any other vessel for holding and transporting milk, an invertible cover, which is a cover and strainer both, so that the same vessel may be used to milk into, to strain the milk, and convey it to market or elsewhere, substantially as and for the purpose described

68,401.—FRUIT BOXES.—J. F. and O. B. Whitney, Milton, N. Y

We claim the box constructed, with hinged movable upper and lower sides f, substantially as and for the purpose specified.

68,402.—MODE FOR RECOVERING LOST ANCHORS.—Charles Barton Whittemore, Boston, Mass.

1st, I claim the supplemental lifting line in combination with an anchor cable, said line being passed through the anchor ring or its equivalent, and so arranged as to be paid out with the anchor cable, substantially as described.

2d, The buoy in combination with the supplemental lifting line applied to the anchor and its cable substantially as and for the purposes set forth.

3d, The combination of the lifting line, g, anchor cable, B, and loop, i, or its equivalent substantially as and for the purposes set forth.

68,403.—EARTH PULVERIZER AND SEEDER COMBINED.—Carman Wilson, (assignor to William L. Smith,) Stamford, Conn.

1st, I claim the combination of the toothed roller and harrow frame, when arranged that whenever the machine is in position to operate upon the ground the roller shall be in advance of the harrow substantially as herein specified.

2d, In combination with such earth pulverizing device, I claim the revolving seed-sowing cylinder, F, constructed and operating substantially as herein specified.

68,404.—WIND WHEEL.—M. W. Woodruff, Belle Isle, N. Y.

1st, I claim the sails, J, constructed with several flat surfaces arranged at different angles, for equalizing their pitch in proportion to their velocity and distance from the center of motion substantially of herein shown and described and for the purpose specified.

2d, The hollow main shaft, C, sliding shaft, k, carrying toothed rack, i, and pinions, g, in connection with the pivoted sails, J, and governor, K, all constructed and operating substantially as and for the purpose set forth.

3d, The antifriction carriage, R S, with horizontal steadying rollers, t t, supporting the bed plate, B, substantially in the manner and for the purpose set forth,

4th, The collar, Q, having an arm or steadying projection, q, working in the bifurcated lower arm of governor lever, r, in connection with the sliding shaft, k, and pivoted sails, J, as herein set forth and for the purpose described.

5th, The gimbal connection, T u, and ring, W, in combination with the lever, P, pitman, D, and revolving bed-plate, B, as herein shown and for the purpose set forth.

68,405.—HORSE HAY FORK.—Edwin Yancy, Utica, N. Y.

I claim the curved lever, E, provided with the rest, L, and pivoted to the arm, D, in combination with the hook, H, link, F, point, B, and shank, A, arranged as and for the purpose substantially as set forth.

68,406.—FURNACE FOR ROASTING ORES.—John Agrell, and John Klepzig, San Francisco, Cal.

1st, We claim a furnace for roasting ores, etc., provided with a rotating hearth with the fire acting on its upper surface as described. We also claim providing a rotary hearth with a door to discharge the ores or contents acted on by the fire.

2d, We claim mounting the rotating hearth of a reverbatory furnace and rollers substantially as described.

3d, We also claim providing the revolving hearth with partitions to hold the brick lining in place.

4th, And in combination with the rotating hearth we claim the stationary stirrers.

5th, We also claim making the shaft which holds the stirrers hollow, for the purpose of supplying steam to the ores, roasted on the hearth.

68,407.—LIGHTNING ARRESTERS.—Arthur Barbarin, New Orleans, La.

1st, I claim the application and use in connection with a paratonnerre, or lightning arrester for telegraph wires, cables etc., of one or more permanent magnets or electro-magnets as and for the purposes herein described.

2d, A lightning arrester in which one or more permanent, or electro-magnets, are combined with the telegraph wire or cable, and other parts of said arrester in the manner shown and described, or in any other form of mechanical arrangement substantially equivalent to the same as set forth.

68,408.—COMPOUND OF CORK, RUBBER, ETC.—Louis Bauhoefer, (Henry Haner Executor) Philadelphia, Pa.

I claim a composition, consisting of a combination of india-rubber, or gutta-percha, with particles of baked or charred cork, as set forth.

68,409.—APPARATUS FOR RECTIFYING AND DISTILLING.—Gustave Bequet, Son. (assignor to himself and Moritz Pinner) New York City.

1st, I claim an apparatus adapted for to make rum, wiskey, alcohol, French spirits and kindered articles when constructed substantially as described.

2d, Constructing a rectifying or distilling column in such a way as to enable the passing through different channels or chambers, within the same column of articles or vapors of different quality or degree, all substantially as described and for the purposes set forth.

3d, Dividing the interior of a rectifying or distilling column into parts in such a manner that either part could be used for a specific purpose without interfering with the functions or operations of the other part or parts, all substantially as herein described.

4th, Using within the interior of one and the same rectifying or distilling column sections, divisions or passages of a variety of constructions, substantially as herein set forth.

5th, Using the cap, c, the stop-cocks, D1 and D2, the passages, E1 and E2, the pipes, F1 F2 G H I, the passages, i and k, or either of these parts, in combination with a rectifying or distilling column, where the latter is divided into compartments substantially as herein described.

68,410.—ROTARY PLOW.—E. T. Bussell, Indianapolis, Ind. (assignor to himself and W. A. Candee and Jacob Eldridge).

1st, I claim segment driving wheels, S, compassing less than half a circle, when used in combination with pinions, p, for the purpose of rotating each auger upon its own axis at the proper point for most effectually breaking and pulverizing the earth substantially as shown.

2d. Supplementary yielding cogs, b b, when the same are attached to flat springs as shown, and these, in connection with the segments, S, as and for the purpose stated,

3d, Dirt shield, f, and its adjunct, e, when these are used and made substantially as shown, and for the purpose specified.

4th, Castor wheel, p2, and roller, m, or their equivalents, when the same are used for graduating the depth of this rotary plow, and for transporting the same from place to place.

68,411.—MACHINE FOR LOOSENING EARTH TO BE EXCAVATED OR REMOVED.—W. H. Butler, Chicago, Ill.

1st, I claim the combination of the frame, B, having the chisels, T, arranged therein as described with the frame, A, provided with the mechanism for moving the frame, B, thereon substantially as set forth.

2d, I claim one or more chisels, T, arranged to be operated as set forth for loosening or digging up the earth preparatory to removing the same substantially as and for the purpose set forth.

68,412.—FEED AND STRAW CUTTER.—A.P. Chapin, Chicopee Falls, Mass.

I claim the semi-circular knife, K, in combination with the knife bar operating in the gate frame, or standards, A A, as set forth and for the purposes described.

68,413.—MEANS FOR HANGING RUDDERS.—W. N. Clark, (assignor to himself and James B. Clark) Chester, Conn. and W. N. Clark, assigns one half his right to Henry Pember.

I claim the plate, P, and tongue, T, in combination with the hinged rudder, R, substantially as herein described and for the purpose specified.

68,414.—MACHINE FOR MANUFACTURING HOES.—W.T.Clement and Edward V. Foster, Northampton, Mass.

1st, We claim the within described for the drop, K, composed of the anvil, I, and pin, J, the latter being full on the side forwards the throat or edge of the hoe and contracted on the opposite side and arranged relatively to the drop, K k k', so as to act on the material, D d, of a hoe substantially in the manner and for the purpose herein set forth.

2d, We claim in connection with the above, making the inclination of the pin, J, adjustable by means of the screws, j1 j2 or their equivalents so as to vary the inclination of the eye of the hoe at will within moderate limits substantially as herein specified.

68,415.—APPARATUS FOR TURNING CRANK PINS ON LOCOMOTIVE DRIVING WHEELS.—Chas. J, Clifford, New Hampton, N. J.

I claim the frame, A, constructed as described in combination with the screws, i and d, frame, C, and the operating mechanism, all constructed and arranged as set forth.

68,416.—FORMING GLASS CHIMNEYS FOR LAMPS.—M. H. Collins, Chelsea, Mass.

I claim the combination and arrangement of the skeleton frame or series of wires, C, with the rod, A, or such rod and the disk, B, such being for use in manner as set forth.

2d, I also claim the combination and arrangement of the piercer, D', with the rod, A, and skeleton frame or wires, C, or such and the disk, B.

3d, I also claim the combination and arrangement of one or more springs, D, and prongs, F, with the rod, A, and the skeleton frame or series of wires, C,

4th, I also claim the combination of the piercer, D', the rod, A, and one or more springs, D, and prongs, F.

5th, I also claim the combination of the springs, F, with each of the prongs, D, the whole being arranged substantially as specified.

68,417.—BUNG FOR CASKS AND BARRELS.—M. C. Cronk, Auburn, N. Y.

I claim a bung with the parts, B T and n, made and operated substantially as and for the purposes described.

68,418.—RESERVOIR PEN HOLDER.—John Darling, Stone, North Britain.

1st, I claim the tubular slide or shield, F, in combination with the tubular holder and its elastic reservoir tube, D, as described.

2d, The flexible diaphragm or pad, a, and sliding head or plunger, E, arranged in respect to the reservoir, A, substantially as and for the purpose set forth.

68,419.—COMBINED ROLLER STALK CUTTER AND MARKER.—J. W. Dilly, Roseville, Ill.

I claim rollers, L L, cutters, P P, journal, S, and frame, A, combined in the manner described and arranged substantially as described for the purposes set forth.

68,420.—OPERATING FEED WHEEL IN SEWING MACHINES.—Arnold Doll, Cleveland, Ohio.

1st, I claim the cam, G, and arm, D, provided with a shoulder, E, the whole constructed and arranged in combination with the wheel, B, for the purpose and in the manner substantially as set forth.

2d, Cam wheel, N, arm, O, slotted arm, I, and link, L, in combination with the cam, G, arm, D, and spring, P, arranged and operating as and for the purpose substantially as described.

68,421.—RAILWAY.—Zebina Eastman, Chicago, Ill.

I claim the rail, a, having a longitudinal groove or concavity in its upper surface adapted for the reception of the convex rims of wheels of cars and other vehicles and formed with a downwardly projecting rim, b, for securing the rail in position upon the ties, when the upper edge of the rail on each side of the groove is notched in the manner and for the purpose described.

68,422—MODE OF PRESERVING COFFEE—August Eikrenkotter, and Frank Silver, Searsville, Cal.

We claim the process herein described for preserving coffee.

We also claim the product as herein described, as a new article of manufacture.

68,423.—METHOD OF MAKING AXE BLANKS.—J. W. Ells (assignor to himself and I. C. Breed), Pittsburg, Pa.

I claim a bar of iron formed substantially in the manner and to the shape herein described, to the end that the same may be divided by cutting transversely into sections of which each shall constitute an ax blank as described as an improved article of manufacture.

68,424.—MACHINE FOR MAKING HOLES FOR PLANTING.—E.R. Ensign, East Hartford, Conn.

I claim the combination of the blade, B, with the beam, A, the handles, H H, and the wheel, W, substantially as specified, the whole forming a machine for making holes for planting as herein described.

68,425.—KNITTING MACHINE.—S. V. Essick, Mansfield, Ohio.

I claim the needle, L, constructed as described the spring, D, the main sliding piece, B, the lever, A, the wheel and rim, J and R, the thread holder, E, the ratchet, F, the spring, P, and the cornered wheel, H, all arranged and operating substantially as described and for the purpose set forth.

68,426.—APPARATUS FOR DISTILLING PETROLEUM.—Hiram B. Everest, (assignor to The Vacuum Oil Company), Rochester, N. Y.

1st, I claim the combination of two or more vacuum petroleum stills, so arranged that the oil is fed from one retort into the other as it increases in specific gravity during the distilation and economizing the use of steam used in the vaporization of the oil in the retorts, by passing it first through the heating pipes in the retort containing the heavier oils, and afterwards conducting it through the heating pipes in the retort or retorts containing the oils of lighter specific gravity, as herein set froth.

2d, The construction of a horizontal elongated cylindrical or elliptical vacuum retort for petroleum arranged and operating in the manner and for the purpose herein set forth.

3d, Connecing the retorts of a vacuum still with the condenser or condensers by two or more goose necks, so as to distribute the exhaust in the retort or retorts, and thus prevent drawing the oil over at the same time facilitating the escape of the vapor as herein set forth.

4th. So combining the capacious condenser or condensers, with the retort or retorts and the condensing coil or coils, that said capacious condenser or condensers will serve as a check to diminish the direct action of the exhaust pump upon the oil in the retorts as set forth.

5th Placing the receiving vessels, F F', in such a position as to allow the distilled oil to be discharged by its own gravity and without passing through the pump as set forth.

6th, Surrounding the upper portion of the retort or retorts by a jacket, or its equivalent for the reception of steam or hot air to prevent condensation as described.

7th, The use in combination with a vacuum still or stills for petroleum and a steam generator of an independent super-heating furnace for heating the steam as specified.

8th, The construction of said super-heating furnace in combination with a steam boiler substantially as and for the purposes set forth when and in connection with a vacuum petroleum still.

9th, The construction of a super-heating for distilling purposes for numerous sections of small straight pipes for advantage of heating surface with facility of building and repairs as shown.

10th, Connecting the main induction and eduction steam pipes, L D', leading from the super-heating to the still with the sections of small heating pipes within the retorts by means of a steam chest, K', bolted to the head of a still, substantially as and for the purposes set forth.

11th. Placing the small sections of heating pipes in the retort in upright position substantially in the manner and for the purpose set forth.

12th, The application to an oil gage to a vacuum petroleum still arranged and operating substantially as set forth.

13th, The combination of a steam generator, super-heating furnace and vacuum apparatus, as a whole constructed and operating substantially in the manner set forth.

14th, The separation of petroleum into the constituent parts specified, and about the proportions named, by means of an apparatus as herein described.

68,427.—SHEEP TABLE.—Green Fenton, Streetsboro, Ohio.

I claim the herein described sheep table provided with adjustable sides, D, foot block, C, and pillow, B, when constructed and arranged in the manner and for the purposes substantially as set forth.

68,428.—TRUSS PAD.—Thos. St Clair Ferriss, Nashville, Tenn.

I claim providing a truss button or pad with a perforated wooden core as and for the purpose specified.

68,429. MACHINE FOR MAKING SEWING MACHINE NEEDLES.—Thaddeus Fowler, Seymour, Conn.

I claim in combination with an intermittently revolving feed wheel carrying a series of mandrels, a dog or pawl for moving said feed wheel when said dog or pawl rakes against the mandrels, themselves as a ratchet to turn the wheel by substantially as described.

2d, I also claim in combination with a feed wheel and a series of mandrels therein, and with the milling and drilling mechanism, a mechanism for stopping and holding the blank under the drill at a quarter revolution or the position it occupied at the mills substantially as and for the purpose set forth.

3d, I also claim in machine drilled needles, the drilling of the hole through the blank, from the bottom of one groove to the bottom of the opposite groove by a mechanism arranged and automatically operated, substantially as herein described and represented.

68,430.—MACHINE FOR REDUCING WIRES FOR NEEDLE BLANKS.—Thaddeus Fowler, Seymour, Conn.

1st, I claim in combination with the turning ratchets, mandrel and blank holder, the dies, F and E, for reducing, and allowing the blanks to elongate under the reduction, substantially as described.

2d, I also claim in combination with the turning ratchets, mandrel, blank holder and dies, tappet wheel, C, with its tappets so arranged as to strike the die, whilst the feed is at rest, substantially as described.

68,431.—WRENCH.—Jas. N. Freestone, Williamsburgh, N. Y.

I claim the sliding piece, S, with its tooth, O, handle, H, jaw, C, and spring, X, all constructed and arranged to operate substantially as described.

68,432.—ENGINE HOSE.—E. W. French, South Scituate, Mass.

1st, I claim a hose sewed through the lapped edges, from inside to outside, when the ends of the pieces of which the hose is formed are joined together by a diagonal row or rows of stitches at one continuous operation, as described.

2d, I claim, in combination with the rows of stitches, formed as above described, a welt or covering, as and for the purpose specified.

68,433.—FEED-WATER HEATER.—J. G. Goesel, St. Louis, Mo.

1st, The combination of a vertical steam drum, receiving steam either from the exhaust of a steam engine or directly from a steam generator, and an inside hot-water tank, substantially as described.

2d, The combination of said steam drum with a series of vertical pipes, be ing connected at both ends, substantially as described.

3d, The combination of the inside water tank, D, and pipe, C, connected at its upper end with the series of pipes, B, and discharging the already hot water near funnel, f, substantially as described, and for the purpose specified.

4th, The combination of inside water tank, D, with pipe, E, connected to the upper part of water tank, D, and conducting the water through steam space of steam drum, either directly or by means of force pumps to boilers.

68,434.—GATE HINGE.—D. H. Gould, Troy, N. Y.

I claim the employment of the bar, p, in combination with the jaws, d d', serving as a guide and support to the parts folding within the jaws, substantially as set forth.

68,435.—GAS APPARATUS.—D. M. Graham, Evansville, Ind.

1st, I claim the construction of a portable gas apparatus with refining and deodorizing chambers, substantially in the manner and for the purpose herein set forth.

2d, The introduction of air into the deodorizing chamber, E, by means of the stop cock, G1, substantially in the manner and for the purpose as herein set forth.

3d, The combination of the tank, A, generator, B, and burner, M, with the refining and deodorizing chamber, substantially in the manner and for the purpose as herein set forth.

4th, The arrangement of the tank, A, generator, B, chambers, E and F, stop cocks, G1 and G, pipe, b, pipe, d, inner cylinder, c, chamber, H, pipe, e, gasometer, I, main pipe, L, and burner, L, and burner, M, substantially in the manner and for the purpose as herein described.

68,436.—LOCK FOR CAR SEATS.—E. Hambujer, Detroit, Mich.

I claim the lock for car seats, consisting of the spring bolt, a b c, catching in the recess of the arm, H, and operated by the screw key, as herein represented and described.

68,437.—STOVEPIPE TO PROMOTE COMBUSTION.—E. Hambujer, Detroit, Mich.

I claim the construction of the flue or pipe of fuel-burning apparatus by dividing the same by an oblique diaphragm A, forming a cold air chamber, open at the bottom, into the throat of the stove or furnace, into which chamber the external air is admitted by one or more pipes or openings, retarding the escape of smoke and partially consumed gases from the fire, and securing a more perfect combustion and economy of fuel, substantially as and for the purpose shown.

68,438.—SWIFTS.—Almone Haskell, Harrison, Me.

I claim the swifts, as herein described, combining the various devices set forth, in the manner and for the purpose specified.

68,439.—CAR COUPLING.—George Hardy Henfield, San Francisco, Cal.

1st, I claim the cam, F, operated by the bar, m, in combination with the jaws, D, closed as herein described.

2d, I also claim the sides, A, jaws, D, spring, E, cams, D and F, and levers, M and N, together with the bar, I, the whole operating as a coupling, substantially as herein described.

68,440.—CULTIVATOR TEETH.—Benj. F. Hisert, Norton Hill, assignor to himself and Geo. W. King, Schoharie, N. Y.

I claim a cultivator tooth or plow attached by a vertical joint to the beam so as to swing horizontally, as and for the purposes set forth.

68,441.—MACHINE FOR CUTTING OFF THE ENDS OF CIGARS.—Frederick W. Hoffman, Morrisania, N. Y.

1st, I claim the arrangement of the knife, J, attached to the knife, G, in combination with the spring bearing, m, in the manner and for the purpose substantially as described.

2d, I claim the arrangement and use of the spring, v, to guide the end of the knife, G, substantially as set forth.

68,442.—SPRING FOR BED AND OTHER PURPOSES.—Joseph Hyde, Troy, N. Y.

A spring composed of the slat, A, or its equivalent, the spring, D, with the fulcra, c, constructed, arranged and operating substantially in manner and for the purposes herein shown and described.

68,443.—CORN PLANTER.—D. W. Jacoby, Shelbyville, Ill.

1st, I claim the metallic cut-off with the rollers, R R, to prevent the cutting of corn, substantially as described.

2d, The manner of regulating the size of the hole in the dropping plate by a semicircular ring in the circular plate, in the manner described.

3d, The combination of the cut-off, D, with the rollers, R R, the top plate, C, and the semicircular ring, B, in the circular plate, A, substantially as described and for the purpose set forth.

68,444.—LOOM HEDDLE.—Chas. Kennedy, Philadelphia, Pa.

I claim a heddle wire, composed of flat wire or metal strip, in which an eye is formed by cutting or splitting the wire and bending the several parts away from each other, as herein set forth.

68,445.—FOUNTAIN PEN.—M. Klein and H. W. Wynne, Keokuk, Iowa.

1st, I claim the air opening, C, with the spring valve, B D, at the top of the ink chamber, A, as and for the purpose specified.

2d, The rod, F E, to raise the air valve, B, with its enclosed passage way, G, substantially as specified.

68,446.—DIE FOR SWAGING MATTOCKS, HOES, ETC.—Christian Konold, Snowden, Pa.

I claim a die for forging mattocks, grub hoes, and similar implements, having two faces, one of which extends across the die, at one end, and is shaped so as to form the blade with thin sides, having a longitudinal-curved ridge down to its center, and making the other part of the die with a concave face terminating at one end in an incline for giving the cutting edge its proper bevel and rounding the face of the blade some distance therefrom towards the eye, as hereinbefore shown and set forth.

68,447.—MOP PAIL AND WRINGER.—Eli H. Lord, Homer, and Egbert Hinman, Syracuse, N. Y.

1st, We claim the combination of the mop pail with the springs, C C, the adjustable rollers, B B, the bail, d, the screw, h, the whole constructed and operated in the manner described.

2d. We claim the bail, d, both for the purpose of a bail, and also for a lever for the purpose of separating the rollers, in the manner described.

68,448.—BANK CHECK.—Albon Man, Brooklyn, N. Y.

1st, I claim the tubular arrangement of the several series of figures and of cyphers, substantially as and for the purpose herein specified.

2d, I claim making each column in a different style from any of the other columns, substantially as and for the purpose herein set forth.

3d, I claim the increasing strength or blackness from one side of the table to the other, substantially as and for the purpose herein set forth.

4th, I claim varying the blackness of the background in the reverse order from that in which the blackness of the figures is varied, substantially as and for the purpose herein set forth.

5th, I claim continuing the columnar arrangement beyond the series of figures so as to provide spaces for the figures to be written therein, substantially as and for the purposes herein set forth.

68,449.—SHEEP CHAIR AND VAT.—George D. Matcham, Pittsfield, Ohio.

I claim the adjustable chairs, G, table, I, and furnace, K, in combination with the vat, A, in the manner and for the purpose substantially as set forth.

68,450.—MACHINE FOR CUTTING AND FOLDING PAPER.—Enos H. McArthur, Hillsdale, N. Y,

1st, I claim the application of a folding apparatus to a paper-cutting machine, substantially as and for the purposes herein set forth.

2d, I claim the movable part, H, of a folding table, in combination with the stationary part, H1, of the same, and folding plate, L, operating substantially as and for the purposes herein set forth.

3d, I claim, in combination with a folding machine, the folding plate, L, substantially as and for the purpose herein specified.

4th, I claim, in a folding apparatus, the folding plate, L, in combination with tappes, L1, cam wheel, Q, spring, L3, operating substantially as and for the purpose herein set forth.

5th, I claim, in a paper cutter, the knife, G, in combination with the angle levers, f4 f5, slot, g, and pin, operating substantially as and for the purpose herein set forth.

6th, I claim the provisions for adjusting the folding table to the different widths of paper to be folded, substantially as and for the purpose herein specified.

68,451.—CARRIAGE JACK.—Jasper P. Moore, Boston, Mass.

I claim my improved carriage jack, made as described, viz: with the slider to encompass and slide on the standard, and with a series of holes, a a a, arranged in the latter in manner and for the purpose specified.

I also claim the slider as made with the three ears, b c d, arranged so as to project from it and with respect to each other, as explained.

68,452.—CAR BRAKE AND STARTING APPARATUS.—Thos. W. Murray, New York city,

1st, I claim the partial ratchet wheels, 2 and 4, pawls, 3 and 8, weighted lever, 9, and lever, 1, all constructed and combined as described and for the purpose set forth.

2d, In combination with the above, I claim the arm, 6, and cam fixed on the wheel, as and for the purpose set forth.

68,453.—TOOL.—John L. Nettleton, New Haven, Conn.

I claim the combination of the sliding bar, D, and its movable ratchet teeth a, with the parallel rack bars, B and C, and cross bar, A, when all the parts are constructed, connected, and fitted for use, substantially as herein described and set forth.

68,454.—DIE FOR MAKING HEADS FOR ELLIPTIC SPRINGS.—Joseph Palmer, Concord, N. H.

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1st, I claim the right and left dies, constructed substantially as and for the purpose herein described.

2d, The application of the ears, fig. 5, to the ends of the main leaf of an elliptic spring, substantially as and for the purpose herein described and set forth.

68,455.—DETACHABLE BUGGY TOP.—Albert M. Plimpton, Hornellsville, N. Y.

1st, I claim the keys, j j, attached to the spring holders, k k, operating substantially in the manner herein described.

2d, I claim the combination of the metal straps, c c and d d, with their openings, e e e e, the vertical studs, h h and i i, with their notches, f f, and the keys, j j, on the spring holders, k k, for the purposes set forth.

68,456.—CLOSING BOTTLES.—N. Prescott, Dorchester, Mass.

I claim the bottle stopper for bottles, cans, and other similar vessels, constructed and applied substantially as described.

I also claim the bottle stopper, b, with the curved slit, n, constructed and operating substantially as described.

68,457.—WASHING COMPOUND.—H. C. Putnam and B. F. Johnson, Squaw Grove, Ill.

We claim the washing compound, consisting of the herein stated ingredients, taken in quantities and proportions set forth, the whole prepared in the manner herein described and specified.

68,458.—MACHINE FOR STRIPPING SORGHUM.—Samuel A. Rankin, Fairhaven, Ohio.

1st, I claim the arrangement of the slides, N and O, operated by weights and cords, in combination with the plate, P, or an equivalent of the latter, all substantially as described and for the purpose set forth.

2d, I claim the combination of the plate, P, slides, N and O, and knife, B, substantially as described and for the purpose set forth.

3d, I claim a combination of the whole, substantially as herein set forth and for the purposes specified.

68,459.—MACHINE FOR DRYING FRUIT.—Dennis Rice, Shelburn Falls, Mass.

I claim the combination and arrangement of the box, a a a, with the glass door, b b b, and the apertures, c c c, and the cupola, d d d, and the shelves, e e e, substantially as and for the purposes described.

68,460.—AXLE BEARINGS FOR WAGONS.—Hamilton Richardson, Janesville, Wis.

1st, I claim the axle, A, having its arm or journal composed of the single solid piece, with the friction rings or ferrules, a, applied thereto at its opposite ends, as herein shown and described.

2d, I claim the axle, A, provided with the flange, n, projecting over the inner end of the box, when used in combination with the box, B, having the collar, t, arranged to shut over the shoulder on the outer end of the axle, as shown and described.

68,461.—DUMPING REEL FOR HARVESTERS.—E. P. Russell, Manlius, N. Y.

1st, I claim raising the cradle shaft at both ends at the same time that the cradles are revolved and carried backward by means of cam, G, plate, H, and crank, L, substantially as and for the purposes set forth.

2d, Cams, G, plate, H, lever, I, arms, J, and crank, L, combined and operating substantially as described.

68,462.—HAY AND COTTON PRESS.—J. S. Schofield, Macon, Ga.

I claim a hay or cotton press, constructed as above described, and having the screw, G, arms, I I, ring, H, box, D, platform, K, and frames, A and L, all combined and arranged in connection with each other to form a press which may rest, in working, either on the frame, A, or in an inverted position, on the frame, L, substantially as and for the purpose described.

68,463.—NUTMEG GRATER.—A. S. Skillin and G. W. Reed, (assignors to themselves, H. L. Hanson, and J. L. Butler), Portland, Me.

We claim the arrangement of the handle or stock, a, the rotary grater, b, spring arm, c, thimble, d, and head, e, for a rotary nutmeg grater, as herein set forth and described.

68,464.—OPERATING CONDENSING ROLLERS IN CARDING MACHINES.—Edwin Stafford, Philadelphia, Pa.

I claim giving to the rubber or condensing rollers of a carding machine a double reciprocating motion, substantially as and for the purpose described.

68,465.—BELT TIGHTENER.—T. G. Stansberry, Medora, Ill.

I claim the slotted shaft, B, provided with a crank and ratchet wheel in combination with the strap, A, having tined hooks at its ends, arranged to operate substantially as shown and described.

68,466.—HULING PLATE.—N. A. Swett, Westerbrook, Me.

I claim the heeling plate, A, when it has the lip, b, the hollow projection, a, and when the same is secured to a last, in the manner described, and then employed as set forth for the purposes specified.

68,467.—THEATRICAL SCENERY.—W. Tanner, N. Y. city.

I claim the manufacture of theatrical water scenes, by arranging strips of thin polished or lustrous metal in respect to each other, substantially as described, upon the stage of a theater, and in the light thereof, as set forth.

68,468.—BUCKLE.—W. McK Thornton, Clinton, Wis.

1st, I claim the combination of the front positions, b b, of the curved side bars, A A, of such width as to receive between them, and afford side supports for the hame tugs, substantially as described.

2d, A trace buckle, constructed and operating substantially in the manner described.

68,469.—CULTIVATOR.—H. H. Tietjens, Lyons, Iowa.

I claim a hand plow, when constructed and operating, substantially as described.

68,470.—APPARATUS FOR DISTILLING.—John Trageser, and Ignatz Illofsky, New York city.

We claim a series of condensing and boiling apparatus, arranged alternately, and fitted in, substantially in the manner specified, and for the purposes set forth.

68,471.—PRINTING PRESS.—L. T. Verney, Paris, France.

1st, I claim the plate, K, its projections, p, levers, L, and connecting rods, L', in combination with the shaft, E, cylinder, E1, projections, p2, and q, the whole being constructed, arranged, and operating, substantially as set forth.

2d, The adjustable guides, r, pins, b and b', plates, N, and levers, O, arranged on the plate, K, and operating in connection with the cylinder, E', substantially as and for the purposes specified.

3d, The traversing ink reservoir, H, its rollers, 1 11 12, in combination with the inking-rollers, f', substantially as described.

4th, The combination of the above, the sliding roller, f', and levers, n n, the whole being arranged and operating substantially as specified.

5th, The vibrating bar, I, operating in combination with the cylinder, E1, and its plate, E2, substantially as set forth.

6th, The traversing reservoir, m', in combination with the cylinder, E1, its plate, E2, and the roller, f3.

68,472.—GRAIN METER.—J. C. Walker, Waco Village, Texas.

I claim the combination and arrangement of the wheel, B, annular chute, A, and brush, C, in a grain meter, substantially as and for the purpose specified.

68,473.—LOW WATER DETECTOR FOR STEAM GENERATOR.—J. V. Weitz, Cleveland, Ohio.

1st, I claim the arm, H, stays, k, weighted rods, L L', as arranged in combination with the sleeve, F, and valve, C, for the purpose and in the manner set forth.

2d, The vertical arm, M, crank, M', and cam, N, in combination with the valve, C, as and for the purpose described.

3d, The lever, N', when operated conjointly by the crank, M', and weighted rods, L, in combination with the valve, B, as and for the purpose set forth.

4th, The eccentric, Q, cam, Q', and lug, b, as arranged in combination with the cam, N, for the purpose and in the maner substantially as described.

68,474.—ARMOR FOR SHIPS OF WAR.—Timothy Whitby, York Road, Lambeth, England.

I claim the protecting those parts of vessels and other structures that are required to be rendered shot proof by the combination of an exterior casing of chill cast metal blocks, and wrought plating, the plating being employed to inclose and retain the chill cast pieces as herein described.

68,475.—VINE TRELLIS.—Levi H. Whitney, Vallejo, Cal.

1st, I claim the combination of the bearing wires, B, lateral wires, C, and vertical wires, D, for the purpose of forming a trellis as described.

2d, The thimbled loop b, shown in fig. 3, substantially as and for the purpose described.

3d, The perforated tag, G, shown in fig. 6, in combination with the trellis wires, B, substantially as shown and described.

4th, The vertical wires, D D, equally spaced and spread apart at their upper ends, and grouped together at their lower ends so as to be secured at a single stake at the hill, substantially as shown and described.

68,476.—SPINNING JACK.—J. H. Winterbottom, and J. Lord, Philadelphia, Pa.

1st, We claim the lever, N, adjustable slides, H and Y, bar, S, curved projection, T, and wheel, R, in combination with a spinning jack, in the manner and for the purpose substantially as shown and described.

2d, The bar, S, curved projection, T, and wheel, R, in combination with the starting bar, O, of a spinning jack, substantially as described.

68,477.—HEMP BRAKE.—Conrad Witt, and Andrus Sina, Davenport, Iowa.

1st, I claim the manner in which the flax or hemp is carried into and taken from the machine by canvas platform, f, running upon rollers, e e1, e2, e3, e4, fig. 2.

2d, We claim the form of the construction of the cylinder break rollers, e e' e'', with knives, d, meshing into each other, and as regulated by slide journal, l, fig. 4.

3d, We furthermore claim cleaners, j' j'', shown in fig. 2.

68,478.—ESCAPE VALVE HOSE COUPLING.—Albert F. Allen, Providence, R. I.

1st, I claim so arranging a hose coupling, that the flow of water toward the nozzle can be instantly stopped or resumed without interrupting the working of the engine, substantially as and for the purpose herein shown and described.

2d, The perforated sleeve, C, in combination with the perforated cylinder, A, and nuts, a b, all made and operating substantially as and for the purpose herein shown and described.

68,479.—WAGON SEAT AND SPRING.—R. L. Allen, N. Y. city.

1st, I claim bringing the springs to eyes, a, formed above and in front of the posts, B, so that the springs will have their fulcra upon the outer ends of the posts, B, and securing the seat, D, upon the said springs, substantially as and for the purpose herein shown and described.

2d, The posts, B, springs, C, and seat, D, in combination with the staples, E, all made and operating substantially as and for the purpose herein shown and described.

68,480.—AUTOMATIC MEASURING CAN.—Thomas D. Arkle, and Harry C. Greer, Bridgeport, O.

1st, I claim the construction and arrangement within the can, A, of the measuring vessel, C, provided with the float, C', to one side of which the index, a, is secured, as and for the purpose specified.

2d, The drip can, G, connected with the inclined tube in the can, A, near its bottom, provided with the spiral spring, all arranged as described, for the purpose specified.

3d, The combination and arrangement of the can, A, having bottom, B, provided with downward projecting discharge tubes, measuring vessel, C, float, C', index figure, a, plate, F, sliding drip pan, G, and inclined tube, containing the spiral spring, and the pump, H, as herein set forth, for the purpose specified.

68,481.—WASHBOARD.—Pierre Andanni, New York city.

I claim the washboard, when constructed of the two boards, B, having inclined grooves, D, and fitting together in the center of the frame, A, in such a manner that the grooves, D, incline downward upon each side from the center, whereby the water expressed from the clothes is allowed to run off freely and without accumulating in the grooves, as and for the purpose specified.

68,482.—CRANK MOTION.—William Bicknell, Hartford, Me., assignor to himself and Alfred Bicknell, South Reading, Mass.

I claim the employment of two or more auxiliary rods, D D', in combination with the pitman and crank of a reciprocating engine, arranged and operating substantially as and for the purpose herein described.

68,483.—HOUSE FAN.—Julius Bloom, New Brunswick, N. J., and August Bloom, New York city.

1st, We claim the combination of the fan wheel, D, constructed as described, and the up and down swinging fan frame, arranged in front of said fan wheel, as herein set forth, for the purpose specified.

2d, The construction and arrangement of the common fan holders, K and L, upright, M, rod, N, operated by the gearing, B, as herein set forth, for the purpose specified.

3d, In combination with the running gearing, m, I claim the hook-shaped arm, J4, fixed to rock shaft, K4, and L4, cross bar, M4, on spindle, N4, whereby the upward and downward swinging fan frame is operated, as and for the purpose specified.

68,484.—BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.

1st, I claim the slotted cork holder, E, in combination with the pin, G, on the ring, F, all made and operating substantially as and for the purpose herein shown and described.

2d, The above, in combination with the cam, H, the same turning on the pin, G, as and for the purpose described.

68,485.—BOTTLE STOPPER.—Horace S. Carley, Cambridgeport, Mass.

I claim a bottle stopper, consisting of the cord, A, made of india-rubber, or other suitable material, and provided with one or more spring wires, B B, which project downward from the work, and which are made and operating substantially as and for the purpose herein shown and described.

68,486.—RAIL FOR BUGGY SEAT.—James Carlisle, Mount Gilead, O.

I claim the bearing bar, C, to a buggy or other seat, in combination with the rail, E, when both are constructed so that the one will fasten to and upon the other, substantially as and for the purpose described.

68,487.—ADJUSTABLE SHIP BUILDER'S MOLD.—Jesse J. Cassidey, Washington, North Carolina.

I claim the adjustable parallel ship builder's mold, constructed and operating substantially as and for the purpose herein shown and described.

68,488.—BORING BAR FOR BORING AND SCREW CUTTING.—E. S. Chapell, Milton, Mass.

I claim the eccentric sliding boring bar, A, in combination with the worm and gear, g g', and lever, q, constructed, arranged, and operating substantially as and for the purposes herein described.

68,489.—COMBINED PLOW AND HOE.—Daniel W. Colburn, Loami, Ill.

I claim a hoe, having its blade, C, constructed of curved form, similar to the mold board of a plow, in order to cast or throw the earth at one side, substantially as and for the purpose set forth.

68,490.—SCALE BEAM.—Elisha P. Crain, New York city.

I claim the tie rod, C, arranged above a scale beam between the stud and front pan, I, substantially as and for the purposes herein shown and described.

68,491.—FIRE ESCAPE.—Tertullus S. Diblin, New York city.

I claim the combination of the fire escape, composed of a frame with its cross rods, spurs, screws, and windlass, and rope ladder, the whole arranged substantially as and for the purpose set forth.

68,492.—VARIABLE CUT-OFF VALVE GEAR.—J. L. Dickinson, Dubuque, Iowa.

1st, I claim, in combination with the sliding block, C, formed of the parts, 1 and 2, and actuated by the governor, substantially as shown and described, I claim the eccentric rods, E and F, acting upon the bar, D, or its equivalent, and upon the oscillating valve, thereby imparting to the arm the motion of either eccentric rod, as the speed of the engine requires, substantially as shown and described.

2d, The arm, G, and bar, D, in combination with the valve stem, A, to support and maintain eccentric rods, E and F, at a uniform distance from the valve stem, or its equivalent, substantially as described.

3d, I claim the two eccentric rods, E and F, arranged with reference to the governor and arm, G, for the purpose herein set forth.

68,493.—WAGON LOCK.—A Downer, Hammondsville, O.

1st, I claim the combination of the system of levers, F G J K, with the pointed and slotted rod, C, and with the brake bar, M, substantially as herein shown and described, and for the purpose set forth,

2d, Attaching the brake shoes, R, to the brake bar, M, by the ears, r', and curved staples, S, substautially as herein shown and described, and for the purpose set forth.

68,494.—BRICK PRESS.—W. S. Drake, Sturgis, Mich.

I claim the box, F, and plunger, E, in combination with the slide or stop, G, arranged to operate in the manner substantially as and for the purpose set forth.

68,495.—STEAM ENGINE GOVERNOR.—John Eddy, Barnesville, Ohio.

I claim the combination of the pillar, A, levers, B C, connecting rod, D chains, E F J, pulley, G, and weight, H, substantially as described, for the purpose specified.

68,496.—PIANO LOCK.—E. L. Gaylord, Terryville, Ct.

I claim the two bolts, E E, working on separate or on a common center or pivot, g, in combination with a vertically moving slide. B, connected with the bolts, and all arranged substantially as shown and described.

68,497.—PIANO LOCK.—E. L. Gaylord, Terryville, Ct.

I claim the two bolts, B B, arranged so as to work on a single pivot or center, c, or or different pivots or centers, in combination with a horizontally moving slide conneced with the bolts as shown, and all arranged to operate in the manner substantially as and for the purpose set forth.

68,498.—SCREW PLATE FOR CUTTING SCREWS.—Henry Gill, Mansfield, Ohio.

I claim the circular dies, C C, with plane surfaces, e e, arranged, adjusted, and held in position, in the manner substantially as and for the purpose specified.

68,499.—BED BOTTOM.—J. S. Grant, Sidney Center, Me.

1st, I claim the combination of the coiled wire springs, E, or their equivalent, the hooks or supports, D, with each other, with the side and end rails, B and C, and with the ends of the cross slats, F, of the bedstead, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the adjustable supports, G, with the springs, E, and side rails, B, of the bedstead, substantially as herein shown and described and for the purpose set forth.

68,500.—HAND HAY RAKE.—J. S. Grant, Sidney Center, Me.

1st, I claim the shoes or rockers, b b, in combination with the rake head, A, arranged and operating as and for the purpose herein described.

2d, The forked handle, D, having its prongs pivoted to the arms, E E', on the rake head, A, in combination with the segment rack, c, the spring dog, h, the levers, d g, the cord, k, provided with the knob handle, m, and the lifting brace, i, constructed, arranged and operating as and for the purposes herein set forth.

68,501.—APPARATUS FOR RAISING SUNKEN VESSELS.—R. W. Hallett, Hudson City, N. J.

1st, I claim the air chambers, C, constructed substantially as herein described in combination with the chains, B, flexible tubes, D, and air chamber, E, as and for the purpose herein shown and set forth.

2d, The combination of the clutches, F, or their equivalent, with the chains, B, and air chambers, C, substantially as herein shown and described and for the purpose set forth.

68,502.—SHADE FIXTURE.—Stewart Hartshorn, N. Y. City.

I claim the attaching of a pawl and ratchet or notched hub to a window shade roller provided with a spring or to parts connected with said roller in such a manner that the tension of the spring will, without any manipulation or adjustment of parts whatever, always be preserved whether the roller be fitted in the brackets or bearings or removed therefrom, substantially as set forth.

68,503.—OIL CAN.—George Hatch, Pomeroy, Ohio.

I claim placing the pump in the recess, B, and attaching and holding it in place by the pipe, a, flange, c, and hook, d, substantially as described.

68,504.—CENTERING TOOL.—Reuben Haworth, South New Market, N. H.

I claim the spindle, A, and sleeve, B, the cup, C, the spring, E, and the drill, D, constructed, arranged and combined and operating substantially as herein shown and described for the purposes set forth.

68,505.—TRACE FASTENER.—Charles Hayden, Newark, N. J.

I claim the pin, A, when provided with the shoulder, a, and ears, b, in combination with the slotted plate, B, and pin, c, all made and operating substantially as and for the purpose herein shown and described.

68,506.—APPARATUS FOR EXTRACTING OIL FROM ANIMAL AND VEGETABLE SUBSTANCES.—Carl Otto Heyl, Berlin, Prussia, assignor to Rudolph Sieg, New York City.

1st, I claim the construction and arrangement of the basis, A, sulphuret of carbon vessel, B, distilling vessel, C, connecting pipes, a, purifying vessel, F, basins, G and H, connected by space, i, desiccating apparatus, J, condenser, P, and reservoir, S, as herein set forth for the purpose specified.

2d, The construction and arrangement of the desiccating apparatus, J, provided with screw conveyor, K, revolving vertical shaft, N, having arm, L, provided with teeth or buckets and blowers, M, as herein shown and described for the purpose specified.

3d, The construction of the suspended vase provided with a removable perforated bottom having central conical projection and a removable perforated partition near the top whereby the seed chamber, A, is formed, as herein shown and described for the purposes specified.

4th, The combination of the basins, G H, when connected together by the space, f, having the downward projections, g, as herein set forth for the purpose specified.

68,507.—GATHERING AND HUSKING CORN.—J. D. Hill, Fort Scott, Kansas.

1st, I claim removing the husks from the ears of corn substantially in the manner herein shown and described, that is to say, by means of hooked teeth with cutting edges attached to an endless apron or belt.

2d, The combination of the belt or endless apron, K, having hooked teeth, S, and buckets, T, attached to it, the shafts, J and L, and receptacle, R, with each other and with the frame, C, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the pulley, D, band, E, pulley, F, shaft, G, and bevel gearwheels, H and I, with each other and with the wheel, A, frame, and shaft, J, for the purpose of imparting motion to the endless apron, K, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the guides, M, constructed as described, knife, O, and spout, P, with each other, with the frame, C, and receptacle, R, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the fans, U, shaft, V, pulleys, Y and Z, and belt, X, with each other and with the shaft, L, frame, C, and endless apron, K, substantially as herein shown and described and for the purpose set forth.

68,508.—HAY ELEVATOR.—G. F. Hipp and J. B. Fast, Nova, O.

We claim the wheel, D, and sweep, J, in combination with each other when said wheel and sweep are constructed, arranged and operated substantially as herein shown and described and for the purpose set forth.

68,509.—MANUFACTURE OF CANNON.—T. N. Hornsby, Simpsonville, Ky.

I claim constructing in the manner described and of the several parts specified consisting of the tube, B, having notches, g h, notched sheet, A, bands, d F, breech piece, D, trunnion brace, G, breech band, H, and breech, J, as herein set forth.

68,510.—CLOTHES PIN.—J. P. R. James, Read's Landing, Minn.

I claim the spring, C, when secured to the jaws, A, by having its long arms, C, fitted in dovetail grooves upon the inner face of the jaws, A, and held in position by means of the staples, a, whereby all lateral movement of said jaw is prevented, as and for the purpose specified.

68,511.—TANNING COMPOSITION.—William Johnson, Shirleysburg, Pa.

I claim an improved tanning composition formed by the combination of the above-mentioned ingredients with each other, substantially in the proportions herein set forth.

68,512.—CHARGER FOR SHOT POUCHES.—Columbus Johnston, Clarksville, Mo.

1st, I claim the combination of the inner and outer tubes, A and B, having side ports and discharge tubes, I, when all are arranged together substantially as and for the purpose described.

2d, I also claim the adjustable plunger or piston head, N, to the inner tube, A, substantially as described for the purpose specified.

68,513.—LEATHER-BACKED HORSE BRUSH.—Obadiah Jones, South Englewood, N. J.

I claim the round-faced leather-backed horse brush constructed as described consisting of the strips of leather, D, of unequal length glued together and to the back, A, composed of strips of leather, a, the bristle plate, B, secured to the smaller pieces of the core, D, bent around said core and secured to the back, A, as herein set forth for the purpose specified.

68,514.—CATTLE PUMP.—E. C. Kellogg, Rome, N. Y.

I claim the platform, A, bearing the rocker beam, G, arranged in relation with the oscillating cylinder, as herein set forth for the purpose specified.

68,515.—THILL COUPLING.—John Knox, Mount Gilead, Ohio.

I claim the spring, c, combined with the slotted eye bolt, e, and grooved coupling pin, g, arranged and operating substantially as described.

68,516.—MACHINE FOR MAKING BUTTON RINGS.—S. B. Lane, Waterbury, Conn.

1st, I claim an improved machine for making button rings, made and operating substantially as herein shown and described.

2d, The revolving pin, B', in combination with the knife, D, and roller, F, all made and operating substantially as herein shown and described.

68,517.—SAWING MACHINE.—G. C. Lathrop, Danville, Mich.

1st, I claim the arrangement of the oscillating frame, G, pivoted at its center upon its cross heads, X, spring, L, weight, T, pivoted spring seat, O, grind, M, and saw, K, as herein set forth for the purpose specified.

2d, The adjustable toothed supports, E, passing through the frame, A, and the pawls, F, constructed and arranged as described whereby the level of the machine is regulated, as herein shown and described.

68,518.—FLY NET.—L. B. and G. W. Lee, Jerusalem, N. Y.

We claim a leather fly net having its horizontal or longitudinal strips, A, placed edgewise, with the strands, B, passing directly through the same a plurality of times in the manner of a lacing and in a vertical direction, substantially in the manner as and for the purpose herein set forth.

68,519.—WOOD VISE FOR A JOINER'S BENCH.—H. E. Long, Plymouth, Ind.

I claim the combination of the pivoted head, E, having the pivoted button, H, and provided with the holes for the passage of the arms, I, pivoted to the face plate, G, said face plate having the plate, g', constructed as herein set forth for the purpose specified.

68,520.—BURGLAR ALARM.—E. F. Mallory, West Springfield, Pa.

I claim the combination of the spring, A, provided with anvil head in combination with hook loop when both are constructed and arranged together for operation substantially as and for the purpose described.

68,521.—OBSTETRIC SUPPORTER.—S. B Manly, Corry, Pa.

I claim the elastic or air cushion, B, provided with side straps, F, and elastic knee and foot bands or straps, substantially as and for the purpose described.

68,522.—YARD FOR SHIPS.—Edward Masters, Cleveland, O.

I claim the improved yard, made in three parts, A B B, and strengthened by brace rods, D, and ring plates, c' G F, substantially as herein shown and described and for the purpose set forth.

68,523.—CHURN.—D. C. McNeil, M. D., DeWitt, Iowa.

I claim. 1st, The churn consisting of the churn box, A, and paddle dashers, C C', all as set forth in combination with the treadle, F, connecting rod, working beam and crank, or their respective equivalents, in manner substantially as above set forth and described.

2d, The paddle dashers, C C', having their axis, D, journalled in the movable uprights, b, in manner and for the purposes substantially as described.

68,524.—ADJUSTING THILLS TO CARRIAGES.—Martin J. Mellyn, Roxbury, Mass.

I claim the lever, A, and the clamp, B, formed of the parts, C and D, arranged and combined substantially as described for the purposes specified.

68,525.—CULTIVATOR.—W. A. Moody, Montezuma, Iowa.

I claim the fitting of the front ends of the plow beams, G C, on pendant rods, F, and connecting the beame by chains, M, to eccentrics, L, on a shaft, K, the beams being connected by a bow-shaped rod or bar, H, all arranged to operate in the manner substantially as and for the purpose set forth.

68,526.—CLOTHES DRYER.—Robert M. Morriell, Plymouth, Ind.

I claim, 1st, The posts, t, of the wings, F, pivoted to the cap, C, and base, A, and slotted to receive the ends of the bars, f2, as herein set forth whereby the wings, F, are operated independently of each other, as and for the purpose specified.

2d, The combination and arrangement of the pivoted and slotted posts, f', removable cap, C, removable base, A, and standard, D, as herein described for the purpose specified.

68,527.—PADLOCK, ETC.—W. H. Murphy, Versailles, Ohio.

I claim the lever, F, in combination with bolt, D, when both are constructed, arranged and hung together substantially as and for the purpose described.

68,528.—WIRE SNAP HOOK.—Seth W. Perkins, Geneseo, Ill.

I claim an improved snap hook formed of a single piece of wire bent into substantially the form shown and described, that is to say, with a ring loop, a', to receive the strap and with its hooked ends, a2, overlapping each other in combination with the single or double buckle tongue, as and for the purpose set forth.

68,529.—MACHINE FOR MAKING BUTT HINGES.—Adrian Rais, (assignor to the Scoville Manufacturing Co.) Waterbury, Ct.

I claim, 1st, the rotary carrying disks, D, D, withdrawal slides for receiving the right and left hinge blanks from the feed boxes, C, C, and conveying them successively to the bending, milling and nailing devices, constructed and operating substantially as herein shown and described.

2d, The pawls, a, a, connected with the slides, E, E, in combination with the rotary carrying disks, D, D, all constructed, arranged and operating substantially as and for the purpose herein described.

3d, The spring dogs, a2 a2, in combination with the rotary carrying disks, D, D, all constructed, arranged and operating substantially as and for the purpose herein described.

4th, The slides, E', E', provided with the arms, e e', in combination with the rotary carrying disks, D, D, arranged and operating substantially as and for the purpose herein described.

5th, The combination of the rotary carrying disks, D, D, with the devices described, for bending, milling and nailing the hinge blanks, the said combination being organized and operating substantially as herein shown and described.

68,530.—FLY OR BALANCE WHEEL.—Robbert Rice, Mineral, Illinois.

I claim a fly or balance wheel, provided internally with compartments of the form, substantially as shown, and partly filled with water or other suitable fluid, to operate in the manner and for the purpose set forth.

68,531.—ALARM MONEY DRAWER.—Ira Robbins, Hughesville, Pa.

1st, I claim the sliding keys, a the inclined rest, d, and bolts, e, acting in the manner and for the purposes substantially as shown and described.

2d, I also claim the collar, r, as attached to the handle of the drawer, operating in the manner and for the purpose substantially as described.

68,532.—MOLASSES CUP.—W. S. Rooney, Albany, N. Y.

I claim the construction and arrangement of the semi-circular plate, D, secured to one side of the pitcher, A, in an inward inclined position, and provided at its center and lower edge with the inclined spout, C, as herein set forth, for the purpose specified.

68,533.—CLAMP FOR HINGES.—Eli P. Seger and Samuel L. Smith, Yonkers, N. Y.

We claim a clamp for hinges, etc., consisting of frame, A, and eccentric or cam, C, substantially as and for the purpose described.

68,534.—SLED.—Jacob Shaaber, Reading, Pa.

I claim a sled, constructed substantially as and for the purpose described.

68,535.—TRACE FASTENER.—James L. Short, Gosport, Iowa.

I claim, 1st, the metal box, A, attached to the shaft or singletree, substantially as described.

2d, The catch, B, held down by the spring, C, combined with the trace tug, E, or their respective equivalents, substantially as and for the purpose described.

3d, The singletree attachment formed of the box, A, catch, B, and spring, C, or their respective equivalents, substantially as described.

4th, The combination with the above described singletree attachment of the guard, D, or its equivalent, substantially as described.

5th, The employment of the safety cord, d, with the singletree attached, with or without the guard, D, substantially as herein specified and described.

68,536.—HAY KNIVES.—Harmon L. Smith, Kalamazoo, Mich.

I claim the blade, A, in combination with the shank, B, curved or bent to a form, a semi-circular foot piece, b, and fitted in a handle, C, all arranged substantially in the manner as and for the purpose specified.

68,537.—CHUCKS.—James M. Smith, Seymour, Ct.

1st, I claim the screw collar, D', fitting over the tube, B, and provided with the groove, h, for receiving the right angular arm, a', of the jaws, C, and with the flange, f, fitting into the groove, e, of right angular arm of said jaw, as herein set forth for the purpose specified.

2d, The jaws, C, when provided with the flanges, d, and having their inner right angular ends connected to the screw collar, D', arranged in re-

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lation with the tube, B, having the circular plate, A, whereby articles of any length are held, passing through said tubes and plate as herein shown and described.

3d, The construction and arrangement ot the annular plate, A, double screw threaded tube, B, collars, D' and D, and flanged jaws, C, as herein shown and described for the purpose specified.

68,538.—DIAMOND KEY.—B. F. Southgate, Bridgewater, Vt.

I claim the diamond key, C, fitting in v A shaped grooves in shaft and bearing, or their respective equivalents, in manner and for the purposes substantially as described.

68,539.—GRINDING MILLS.—C. N. Taylor, Cookstown, N. J.

I claim the combination of the plate, a, in the hopper with the cord or chain, C, swinging bell, B, elbow clapper, e, and pin or stud, f, substantially as and for the purpose herein shown and described.

68,540.—LOCKING DEVICE FOR GATES IN PRESSES.—William Welch, Bridgeport, Ct.

1st, I claim the plate, C, secured to the gate, of a power press by means of the pins, e, having cranks, f, and slotted plates, h, as herein shown and described.

2d, The box, B, when made of two pieces in combination with the plates, d, d, for the purpose of permitting the easy removal of the box, substantially as herein shown and described.

3d, The arrangement of the removable box, B, between the plates, d, and pins, e, on the plate, C, as herein set forth for the purpose specified.

68.541.—SPINNING JACK.—A. B. Woodbury, Ashmelot, N. H.

1st, I claim the movable pin, n, provided with a spring in combination with the twist gear wheel, h, arranged and operating substantially as and for the purposes herein described.

2d, The cap cover, q, connected with the lever, l, in combination with the movable pin, n, in the twist gear, h, the stop, k, on the cord, j, and the jack, C, arranged and operating substantially as and for the purposes herein set forth.

68,542.—UNIVERSAL JOINT.—A. Zurebel, Burlington, Wis.

I claim the combination of the ring, A, having semi-circular flanges, a, b, wooden pin, B, lips, d, on knuckles, c, and shank, C, all constructed as described.

68.543.—SAFETY CAR PLATFORM.—C. R. Abbott, Elmira, NY.

I claim the safety way herein described, when composed of the sliding tubes or bars, e, socket joints, g and f, substantially as and for the purposes set forth.

68,544.—CORN PLANTERS.—J. K. Andrews and J. Deloss Green, Antrim, Ohio.

1st, We claim the two frames, A and B, hinged together, as seen and provided with the wheels, F, F and G, when used and operating as and for the purpose set forth.

2d, The hopper, J, bar, K, and roller, L, L, arranged and used with the frame, A, as and for the purpose set forth.

3d, The arrangement of the lever, a, bar, d, with the frames, A and B, and bar, K, as and for the purpose specified.

4th, The rollers, L, L, or their equivalents, used in the manner substantially as and for the purposes set forth.

68,545.—PLOW CLEVIS.—Harrison W. Austin and William Schaw, Kalamazoo, Mich.

We claim the construction and arrangement of the vertical bar, A, double tice, D, single tubs, E, E and F, as herein described for the purpose specified.

68,546.—ROTARY MEASURING FAUCETS.—John G. Baker, Philadelphia, and William Harbster, Reading, Pa., assignors to the Enterprise Manufacturing Co., of Philadelphia.

We claim the valve, c', constructed and operating substantially as described, in combination with the rotary measuring faucet.

68,547.—MACHINE FOR CONNECTING STRIPS OF METALS.—Henry A. Bartlett, Philadelphia, Pa.

1st, I claim the former, D and D', dies, g, g'. and g'', when constructed and operating substantially in the manner and for the purposes set forth.

2d, I claim the combination of the clutch as described, with the former, D', by means of levers. e, e', f, o, l, l, j, l, m, and the whole operating substantially as described and for the purposes set forth,

68,548.—APPARATUS FOR AND METHOD OF CASTING ALUMINUM.—Jas. B. Bean, (assignor to self and A. H. Balderston,) Baltimore, Md.

1st, I claim the flask, B, B', in combination with the frame or holder, A, having the posts, a, a, a, a, and the set screw, a', a', constructed as and for the purpose specified.

2d, The flask, B, B', having the vents, C, C, and the gate, d, all constructed and arranged substantially as described.

3d, Stopping the vents, C, C, with the small rods, e, e, e, as and for the purpose set forth.

4th, The conduit, D, composed of soapstone or other similar material in combination with the gate, d, as described.

5th, I claim supplying fluid metal to compensate for the contraction of the metal in the mold, as well as to secure a denser casting by means of the detachable reservoir, D, heated previous to pouring the metal, substantially as described.

6th, Expelling the atmospheric air from the mold by means of, and substituting therefor, a gas, which is destitute of oxygen, in the manner and for the purpose set forth.

7th, The flask. B B', constructed, gated, and rented, substantially as described, in combination with an interior lining composed of pumice stone and plaster of paris, in proportions, substantially as set forth.

68,549.—CULTIVATOR.—J., S. and Wm. Benson, Lebanon, Pa.

1st, We claim the use of the blocks, g' g'', more or less in number, and the blocks, z z, more or less in number, arranged upon the rods, i, and so combined with the standards, f, as to allow the arrangement of either standards or blocks on either side of the bars, s s, when desired, and for the purposes specified.

2d, We claim the guides, h h, when arranged, combined, and used, substantially in the manner described, and for the purposes set forth.

68,550.—PLOW.—E. L. Bergstresser, Hublersburg, Pa.

1st, I claim the slotted plate or plates whereby the angle of presentation of the plow, both vertical and horizontal, is adjusted, in the manner described.

2d, The block standard, or plate, to which the handles are connected, adapted to fit and to be adjusted upon the adjacent face of the plate, or angle iron attached to the plow beams, substantially as described.

3d, The angle iron constructed as described, or its equivalent, provided with the vertical and horizontal slots, and adapted to be used in connection with the plow beam and handles, or handle block, substantially as and for the purpose set forth.

68,551.—BED BOTTOM.—B. R. Boynton, Keeseville, N. Y.

I claim providing the slats with slots, and the springs with loops, upon their upper ends, said loops being pressed through the slots, and confined by means of straps, substantially as specified.

68,552.—CURTAIN FIXTURE.—E. T. Briggs, Boston, Mass.

I claim the tape, L, or its equivalent, for connecting the rod or spindle, D, to the block, K, or to the cas g, A, operating substantially in the manner and for the purpose set forth.

I also claim the bracket, H, with its bearing, and the lever, M, with its notch or recess, U, in combination with the plate, G, or its equivalent, with its arbor, s, and projections, d e, constructed, arranged, and operated, substantially as and for the purpose set forth.

68,553.—FENCE, GATE.—Nicholas Burch, N. Fairfield, O.

1st, I claim the rotating guide, F, and eye, G, in combination with the gate, substantially as and for the purpose set forth.

2d, The rotating guide, F, roller, L, guide rollers, K, bracket, G, in combination with the gate, substantially as and for the purpose set forth.

68,554.—CARRIAGE BOLT.—O. C. Burdict, New Haven, Ct.

I claim a bolt, having formed upon one or more sides of its neck a rib, a, substantially in the manner and for the purpose as set forth.

68,555.—HEADING BOLT.—O. C. Burdict, New Haven, Ct.

I claim the combination of the dies, a a, and b b, acting simultaneously, and moved in guides, radially, to a common center, by means of the levers, N, and cams, P, in combination with holding dies, E and E', and upsetting die, M, all constructed and arranged to operate substantially in the manner as herein set forth.

68,556.—NUTT MACHINE.—O. C. Burdict, New Haven, Ct.

1st, I claim the levers, L, arranged so as to operate the several sides of the die, in combination with the crowner, i, and the punch, F, all arranged to operate substantially in the manner described.

2d, The combination of the weight, W, with the crowner, i, arranged so as to make the said crowner self-adjusting, substantially in the manner described.

3d, The auxiliary swaging dies, 2 2, when arranged to operate with the two parts of the die, e e, substantially as and for the purpose specified.

68,557.—PLATE LIFTER.—James A. Burns (assignor to himself and T. B. Carpenter). New Haven, Ct.

I claim the two clasps, B and C, in combination with the handle, A, when the said clasps are both hinged to the handle, and constructed and arranged so as to operate substantially as described.

68,558.—SKATE.—Robert Carmichael, Newark, assignor to to Frederick Stevens, Essex County, N. J.

I claim the combination of the clamps, F F, as constructed with the screw shaft, E, as and for the purpose set forth.

68,559.—CHECK HOOK.—Ernest Denning, Middletown, Ct.

I claim the check hook, A, formed with a screw shank, Z, and nut, C, and combined with a tongue, D, substantially as described, as an improved article of manufacture.

68,560.—CHURN.—John E. Finley, Memphis, Tenn.

I claim the combination of the flanged wheels, C C C F F, with the air cups, D D, the thimble, B, and middle thimble, E, and thumb screw, E, the nut, H, and key, J, for the purpose herein set forth.

68,561.—PROCESS FOR DISINTEGRATING AND DESULPHURIZING ORES AND MINERALS.—William T. Goodwin, East N. Y., and Charles R. Squires, New York city.

We claim, 1st, The use of oyster, clam, or other shells or bone, for the purpose of desulphurizing, disintegrating, dissolving, and separating rocks and ores, in the manner substantially as described.

2d, Burning oyster, clam, or other shells or bone, or limestone, in furnaces or retorts, with rock or ore, for the purpose of disintegrating and desulphurizing such ore or rock preparatory to extracting the gold or other precious metals, substantially as described,

3d, Burning oyster, clam, or other shells, or limestone or bone, in retorts, and securing the gases obtained therefrom in bags or vessels, to be used as and for the purpose substantially as described.

4th, Heating rock or ore in a retort, for the purpose of disintegrating and desulphurizing the same, and also for the purpose of securing and retaining the particles of the precious metals, which may be driven off from the ore and deposited in a vessel, substantially as described.

68,562.—BUTTON.—R. H. Guilford, West Cheshire, Ct.

I claim a button formed of wire, as a new article of manufacture, substantially as herein set forth.

68,563.—SEED SOWER AND CORN PLOW.—Patrick Hackett, New Genesee, Ill.

I claim, 1st, The combination of the seeding cylinder, D, and the fixed plow, H, and removable plow, H' so that the machine may be used for seeding, cultivating, or plowing corn, substantially as described.

2d, The combination of the frame, B, with arms, B2, beams, G, and shovel standards, H. and H', and rod, I, arranged substantially as set forth.

3d, The combination of the tongue, A, frame, B, and plows, with the rod, I, constructed and arranged to operate substantially as described.

4th, The combination of the wheels, C, pulleys, E and F, and seeding cylinder, D, constructed with adjustable slides, C, and arranged to operate substantially as set forth.

68,564.—BOILER FOR CULINARY PURPOSES.—William H. Henderson, Franklin, Ind.

I claim the steamer, B, provided with a flange, C, extending down into a pot or vessel, A, as and for the purpose specified.

68,565.—BLAST FURNACE FOR MAKING IRON.—David W. Hendrickson, and James P. McLeane (assignors to David W. Hendrickson), New York city.

1st, We claim the use of the air pump, C, to produce and keep up a uniform blast.

2d, We claim commingling the super-heated steam and hot air in the same tweer or tweers, E E', which are suitably arranged through the walls of the furnace, A, and operated by means of an air pump, or its equivalent power, substantially as above set forth.

68,566.—FURNACE FOR MAKING IRON.—David W. Hendrickson and James P. McLean (assignors to D. W. Hendrickson), N. Y. city.

1st, I claim the vertical flue, D, through the center of the boiler, and forming a part of the same with shoot, s, which passes transversely through the boiler, B, at any suitable angle for the purpose, set forth and shown in the drawings.

2d, We claim the non-conducting plastic coating, P P P'', P'' P''' P''', prepared and applied in the manner and for the purpose substantially as described.

68,567.—NAIL CLINCHER.—John Koyl, Rockford, Ill.

I claim a clincher when constructed with adjustable heads, A1 or B1, substantially as set forth.

68,568.—HAY AND COTTON PRESS.—Moses McElroy, Springfield, Ill.

I claim the herein-betore described arrangement of a double platen power press consisting of the double screws upon the rods, A, the double endless screws, D D1, spurs, B, platens C C, and plates, F F, forming bearings for the endless screw, D, supported by shoulders upon the rod, A, which pass through them, substantially as described.

68,569.—HITCHING STRAP.—John D. Miller, Russellville, Pa.

I claim, as an article of manufacture, a halter or hitching strap composed partly of elastic and partly of rigid material, as herein described.

68,570.—WHIFFLETREE IRON.—F. B. Morse, New Haven, Ct.

I claim the herein described whiffletree iron as an article of manufacture.

68,571.—PAPER-RULING MACHINE.—William B. Pollock, Holyoke, Mass.

I claim, 1st, The combination of the middle bearing, h, end bearings, n n, and rod, e, with the strip, A, substantially as described.

2d, The simple clamp, B or C, constructed as described, with the projection, D1, in combination with the nut, g, bearing, n, rod, e, and its register wheel, d,

3d, The clamp for using detached pens when constructed and operating substantially as described.

4th, The combination of two simple clamps, or of two clamps for using detached pens, or of one clamp of each kind, with the strip, A, the whole and each part thereof constructed and operating, substantially as described.

5th, The use, in a paper ruling machine, of two clamps or series of pens, each clamp or series having an independent lateral adjustment in combination with a supporting strip.

68,572.—CARRIAGE JACK.—Parker C. Porter (assignor to himself and R. M. Mansur), Augusta, Me.

I claim the notched or stepped bar or lever, in combination with the pivoted leg or pendant, constructed and operating in the manner and for the purpose set forth.

68,573.—WASHING MACHINE.—A. Powell, Coxsackie, N. Y.

I claim, 1st, The combination of the vertical ribs, C, and the dasher, constructed of the pieces, e1 e2 e3 e4, substantially as described.

In combination with the above, the detachable handle, G, constructed with forked end straddling the piece, e1, of the dasher, substantially as described.

68.574.—THRASHING MACHINE.—C. C. Reynolds, N. Y. city.

I claim hanging the teeth to the concave of grain-thrashing and other machines, that they can be swung in and out of position, substantially as described.

68,575.—HAME FASTENER.—John R. Richardson, New Castle, Pa.

I claim the bar, B, with its groove and opening, D, and with its ears, e e, between which is pivoted the tongue, C, constructed as described, for securing the slotted bar, A, in the manner and for the purposes specified.

68,576.—CLOTHES WRINGER.—Warren Rowell, New York city, assignor to the Metropolitan Washing Machine Company, Middlefield, Conn.

1st, I claim, in the gearing of clothes-wringing machines having two or more sets of teeth arranged to present the teeth of one set opposite the spaces in the other set, on the same shaft, as herein specified, reducing the number of the teeth and increasing the pitch thereof, substantially in the proportion and so as to accomplish the purposes herein set forth.

2d, I claim the manufacture of step gear, cast in pairs, the formation of a connection or support between the teeth to strengthen them, substantially as herein set forth.

3d, I claim a ring, D, betweeen the gears, A B, arranged substantially as described so as to prevent them from meshing deeper than is desired, as herein set forth.

4th, I claim, in the manufacture of step gears, when cast double, so constructing the ring, D, by casting it in one with the gears, that it shall at the same time strongly support the lath and prevent the gears from working deeper than desired at the nearest approach of the rolls, all substantially as and for the purpose herein set forth.

5th, I claim beveling the faces, d1 d2, of the ring, D, and the corresponding faces of the teeth which come in contact therewith, substantially as and for the purposes herein set forth.

68,577.—ELECTRO-MAGNETIC PUMP.—C. H. Rudd and G. W. Shawk, Cleveland, Ohio.

We claim the magnets, A A1, as arranged in combination with the armature, J J1, piston, F, and rods, a c, in the manner and for the purpose substantially as set forth.

2d, The application of the electro-magnetic apparatus to the pump, when constructed and arranged to operate conjointly, as and for the purpose substantially as specified.

68,578.—SPRING.—George C. Smith and Boswell S. Judson, Matteawan, N. Y.

We claim the wooden plates, B B1, the rubber plugs, C C, and the metallic springs, A A, connected and used substantially as and for the purpose set forth.

68,579.—CAR BRAKE.—James L. Smith, Tuscola, Ill.

I claim the arrangement of the wheel, C, with its shoulders, x x, lever, D, hinged as shown, and with its shoulder, z, in combination with the brake shaft, F, dog, H, and ratchet, G, in the manner and for the purposes specified.

68,580.—STONE-DRILLING MACHINE.—A. M. Southard, Savannah, Mo., assignor to himself and W. J. Hobson.

1st, I claim the arrangement of the shaft, F, and its pinions and lever, P, with the plates, G and G1, and their shaft, H, arms, o o, and gear wheels, I and J, as and for the purpose herein specified.

2d, The disks, N N, constructed as described, and used in combination with the bars, L L, shaft, F, plates, G G1, shaft, H, arms, o o, and gear wheels, I and J, the whole arranged and operating as specified.

3d, The arrangement of the bars, L L, in and with the adjustable eyes, e e, as and for the purpose set forth.

68,581.—HARVESTER PITMAN.—Geo. L. Squier, Buffalo, N. Y.

I claim the connecting rod, A, provided with a conical wrist pin, A1, in combination with a compensating rubber, or spiral spring, C, and screw nut, d, for the purpose and substantially as described.

68,582.—MEDICAL COMPOUND.—Wm. H. Tate, Orleans, Ind.

I claim a medicine composed of the extract of arctium burs, combined with the spirits of lavender and alcohol, substantially as herein specified.

68,583.—LOOM.—Thomas G. Thompson and Barclay Ballard, Richmond, Ind.

1st, We claim the brackets, K K, in combination with the bottom ports, F F, pivots, I, and the side rails, A A, all constructed and arranged as herein described.

2d, The combination of the warp beam, L, spur wheel, J, pivoted let-off lever l, rack, i, stop, T, cloth ream, D, ratchet wheel, d, take-up lever, H, and pawls, 5 and 6, when constructed, arranged, and operating as and for the purposes herein set forth and described.

68,584.—FILE.—Alfred Weed, Boston, Mass.

I claim, as a new article of manufacture, a file, when made substantially as described.

68,585.—FILE HANDLE.—Alfred Weed, Boston, Mass.

I claim a tool-holding handle as made with jaws arranged to have an adjustment with respect to each other, one or both of which are provided with a transverse rib or ribs and a longitudinal groove or grooves, constructed substantially as described.

68,586.—BILLIARD-TABLE CUSHIONS.—C. E. Wilcox, Milwaukee, Wis.

I claim a billiard-table cushion, when made with slot, C, in its top, substantially as and for the purpose described.

68,587.—HAY RAKER AND LOADER.—Milo Webb, Chenango Forks, N. Y.

1st, I claim the arrangement of pullevs, M O Q R S T, endless cords, U, and rakes, V W, in the described combination with the clearing finger or rake, 7, as set forth.

2d, The combination of the endless series of rakes, W, the guards or directors, 4, and conducting fingers, 8, all constructed and arranged substantially as and for the purposes set forth.

3d, The combination. with an endless series of rakes, of the rocking beam, Y, for enabling the bottom rake to skim without tearing up the ground, in the manner set forth.

4th, I claim the adjustable bracketed bearings, Z, in combination with the rocking beam, Y, for the purpose explained.

5th, The combination of the pulley, Q, and carrier, X, with the endless rakes to tighten them, as described.

68,588.—INKSTAND.—Samuel Darling, Bangor, Me.

I claim an ink reservoir, having a central recess or depression, in combination with a follower, having a gage cup projecting so much below the body of the follower as to admit of being inserted sufficiently into the ink while the body of the follower is always above the ink.

I also claim the rib, K, as arranged in cavity, D, in combination with the cover, C, substantially as and for the purposes described.

I also claim the opaque belt or band, on the interior of the reservoir, in combination with the plaster of Paris, or its equivalent, as and for the purposes specified.

REISSUES.

2,758.—AGRICULTURAL FORK.—Abram and Charles Clow, Port Byron, N. Y., assignees of Charles, Abram and Charles N. Clow. Patented Dec. 8, 1857.

1st, We claim in combination the metallic head, A, and wooden tines, B, substantially as and for the purpose herein specified.

2d, The arrangement of the ribs or braces, f, running obliquely from socket to socket, and crossing with relation to each other upon opposite sides of the head, as and for the purpose set forth.

3d, The arrangement of the sockets, a a, diverging laterally from the rear to the front of the head, in the manner shown and for the purpose set forth.

4th, The conical sockets, a, when made tapering from the rear of the head toward its front in connection with the wooden tines, B, and metallic head, A, substantially in the manner and for the purpose set forth.

5th, The brace, E, and bow, D, when attached to each other with a hinge joint so as to fold together without being detached from each other, substantially in the manner and for the purpose described.

6th, The jointing of the bow, D, on to the head, for the purpose and in the manner substantially as described.

2,759.—SUGAR-CANE MILL.—S. L. Denney, Christiana, Pa. Patented Sept. 28, 1858.

1st, I claim eccentric boxes when used to support the journals of shafts or cylinders for the purpose of effecting compensation for the wearing away of the journals and bearings, substantially as described.

2d, The eccentric boxes, R, in combination with the arms, c c, and the lever, F, as and for the purpose set forth.

2,760.—GRATE FOR FURNACES.—Eugen Langen, Cologne, Prussia. Patented Nov. 14, 1865.

1st, I claim the employment of two or more shelves, or their equivalents, adapted to receive fuel and allow it to be pushed forward thereon, into and under the fire at different levels in combination with grates, or their equivalents, connected therewith at different levels, the whole being arranged for joint operation substantially as and for the purpose herein set forth.

2d, I claim the cinder section or ash pits, j, arranged relatively to the shelves and grates at different levels, substantially as and for the purpose herein set forth.

3d, I claim the grated door, z, turning on trunnions as represented and arranged to operate relatively to the cinder support, j, and the superior portions, f g, of my compound grate, substantially in the manner and for the purpose herein specified.

2,761.—BARREL WASHING MACHINE.—Jonathan Peacock, Rockford, Ill. Patented March 13, 1866.

1st, I claim the combination substantially as described of the clamping frames (arranged end to end) with the locking device so that the barrels in each frame may be revolved independently of those in the others or all may be revolved together,

2d, The arrangement of the clamping frames, as described, whereby the barrels in each frame are counterbalanced by those in the other;

3d, The combination in the manner described of the adjustable clamping rails with the rotating heads.

4th, Arranging the slots in which the clamping rails, d, are adjusted parallel to each other and tangentially to the axis of rotation of the frames, as described.

5th, The arrangement as described above the rotating clamping frames of the water trough divided into compartments by the transverse partition provided with the valve which regulates the supply of water to one of the compartments whereby I equalize the quantity of water admitted to each barrel.

6th, The arrangement as described of the trough, the slide valve in its bottom and the filling pipes.

7th, The combination as described with the water trough and filling pipes of the lifter which simultaneously withdraws all the pipes from the barrels and holds them out of the way of the revolving barrels.

EXTENSIONS.

DESIGN FOR A SPOON HANDLE.—George Sharp, Philadelphia, Pa. Letters Patent No. 1,880. Dated Jan. 5, 1864.

I claim the globular finish consisting of the parts, A a2 a3, as an ornamental design for the ends of the handles of the articles of table use specified.

COOKING STOVE.—Giles F. Filley, St. Louis, Mo.—Letters Patent No. 9,788. Dated June 14, 1853. Reissue No. 873. Dated Dec. 27, 1859

I claim, 1st, The following enlargemeut of the side flues, C C and D D, from the space above the oven to the flue space, E, which extends under the entire front end of the oven and also the flaring enlargement of the central flues, F and G, from the flue space, E, to the upper end, G, for the purpose of increasing the draft of the stove, substantialty as herein set forth.

2d, I also claim separating the front of the oven from the front plate of the stove and also from the hearth plate and from the back plate of the fire chamber by means of the flue space, H, which communicates freely with the flue space, E, and is closed at all other points, the said arrangement enabling the flue space, H, to arrest the great amount of heat that will be radiated from the back plate of the fire chamber, and conduct the same (by means of the circulation which it will create in said flue space) into the flue space, E, for the purpose of producing the beneficial results herein particularly set forth.

LOOM.—Christopher Duckworth, Mount Carmel, Conn. Letters Patent No. 9,815. Dated June 28, 1853. Reissue No. 2,018. Dated July 4, 1865. Div. 1.

1st, I claim a power loom which is provided with many-celled shuttle boxes the movements of which are automatically controlled in such manner that the cells of the boxes can be skipped over and any desired shuttle thrown from any box in the combination according to the character or figure to be woven, substantially as described.

2d, Providing for operating many-celled shuttle boxes so as to bring any desired shuttle into action by means of pawls, ratchets and reversible tappets, in combination with pattern surfaces which will control the figure to be woven, substantially as described.

3d, The use of tappets which receive both a rotary and an oscillatory motion from a pattern or patterns in combination with many-chambered shuttle boxes, substantially as described.

POWER LOOM.—Christopher Duckworth, Mount Carmel, Conn. Letters Patent No. 9,815, dated June 28, 1853. Reissue No. 2,019, dated July 4, 1865. Again reissued No. 2,193, dated March 13, 1866. Division A.

I claim the combination of a reversible mechanism, with the reversible revolving tappets used in the loom to move the shuttle boxes in a vertical direction, substantially as and for the purpose described.

Also the combination of the pattern mechanism of the loom with a reversible ratchet mechanism and the reversible revolving tappets, substantially as and for the purpose described.

POWER LOOM.—Christopher Duckworth, Mount Carmel, Conn. Letters Patent No. 9,815, dated June 28, 1853. Reissue No. 2,019, dated July 4, 1865. Again reissued No. 2,194, dated March 13, 1866. Division B.

1st, I claim giving alternate movement to the shuttle boxes in a horizontal plane, by means of pawls, reversible tappets, and a contrivance which will automatically control the movement of said pawls, substantially as described.

2d, Giving an alternate diagonal movement to the shuttle boxes by means of pawls, reversible tappets, and a contrivance which will automatically control the movements of said pawls, substantially as described.

3d, The combination of reversible tappets with shuttle boxes which are so applied to the loom that they will admit of being moved either laterally, vertically, or diagonally, substantially as described.

4th, Giving an intermittent oscillating or rotary movement to a shuttle box actuator by means of pawls and ratchet wheels, which are controlled by can surface, t, or its equivalent, substantially as described.

5th, The use of tappets which receive a forward and backward movement or a continuous rotary movement, in combination with many-chambered shuttle boxes at both ends of the lathe, which boxes are connected together by a lever, G, and operated simultaneously by means of said tappets, substantially as described.

6th, Giving a reciprocating movement to many-chambered shuttle boxes of looms by means of contrivances which are controlled automatically, in such manner that the boxes are moved a greater or less distance by a single vibration of the lathe, so as to throw the shuttles in regular order, or to skip a shuttle, according to the figure which is desired to weave, substantially as described.

SIDE LIGHT FOR SHIPS.—Enoch S. Hidden (assignee of Enoch Hidden), New York city. Letters Petent No. 9,811, dated June 21, 1853. Reissue No. 1,553, dated Sept. 8, 1863. Reissue No, 1,633, dated March 15, 1864.

I claim, 1st, The combination, substantially in the manner described, of a turning flange, arranged, shaped, and operating substantially as specified, with a glass frame and suitable interposing packing, whereby the packing may be compressed and the frame held shut or have liberty to open under a mode of operation substantially as set forth.

2d, I claim, in combination with a glass frame and a turning flange substantially such as are described, a pin and a stop cperating substantially as set forth.

3d, I claim a stationary frame with projecting lugs having long mortises therein, in combination with pins projecting from a glass frame, both substantially such as herein set forth, so that the glass frame may be opened and shut substantially as set forth.

And lastly, I claim, in combination with a stationary frame attached to the side or deck of a vessel, a sleeve or ring of lead or other ductile metal, soldered or otherwise joined thereto, so that it can be flanged or turned over the edge of the opening through the vessel, thereby making the joint between the stationary frame and the vessel water tight, substantially as described.

MANUFACTURING COPYING PAPER.—William Mann, Philadelphia, Pa. Letters Patent No. 9,536, dated Jan. 11, 1853. Antedated July 11, 1852.

I claim the copying paper herein described composed of Manilla fiber or the equivalent thereof, tempered with cotton or its equivalent, substantially as herein set forth.

ELECTRO-MAGNETIC ALARM.—Lucy A. Pope, administratrix of Aug. R. Pope, deceased, Somerville, Mass. Letters Patent No. 9,802, dated June 21, 1853. Reissue No. 566, dated June 8, 1858.

I claim, 1st, The mode of breaking and completing the circuit or vice versa, that is by the spring circuit breaker operating to cause the vibration of the armature.

2d, So combining a hammer and bell with the self-vibrating armature, that the vibrations of the latter shall produce a continued ringing of the bell under circumstances substantially as described.

3d, The combination of these parts (viz., the circuit breaker, hammer, bell, and vibrating armature), or their equivalent or equivalents, with a self-acting spring or key in a door or window, to operate so as not only to bring them automatically into action when the door or window is open, but maintain a continuous or continued ringing of the bell, by the interruption of the electric current without intervention of other machinery.

CULTIVATOR PLOW.—Wm. Hyde, Townsend, Ohio. Letters Patent No. 9,798, dated June 21, 1853.

I claim the cultivator herein described, with adjustable supplementary wings, so constructed as to cultivate the soil superficially near the roots of the plants and deeper at a distance therefrom, the wings being adjustable to any required angle with the bottom of the furrow, so as to give any desired degree of inclination to the sides of the ridges or hills and to change their inclination from time to time to adapt them to the varying stages of the growth of the plant, the whole being constructed and operating as described.

GUIDE FOR CORDING AND HEMMING UMBRELLA COVERS.—S. C. Bloodgett, Bridgeboro, N. J. Letters Patent No. 10,386, dated Jan. 3, 1854. Antedated July, 3, 1853.

I claim the guide for cording or hemming umbrella covers, arranged upon a stand with a curved slot to fold the hem around the cord, and a hole

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through which the cord is passed to its place; and this I claim whether the guide be used alone or attached to a sewing machine.

SHEET METAL BEAM.—Richard Montgomery, New York city. Letters Patent No. 9,842, dated July 12, 1853. Reissue No. 2,668, dated July 2, 1867.

I claim a beam formed of sheet metal bent into a series of longitudinal folds, the sides of which are flat and parallel and the tops and bottoms uninverted and inverted arches respectively.

I also claim the combination with such beam of a pair of saddles to support its ends, substantially as herein set forth.

METHOD OF HEADING SCREW-BLANKS, RIVETS, ETC.—William E. Ward, Port Chester, N. Y. Letters patent No. 9,508, dated Dec. 28, 1852.

I claim, in combination with the swedge header and die plate substantially as specified, the giving of a back or receeding movement at the end of the heading operation to the follower against which the point of the thread rests during the heading operation, substantially as specified that the rod or wire may be upset outside of the die, whilst resistance is made by the follower against the end of the rod and then as the follower retires causes the part to upset to be griped between the surface of the die and the swedge to complete the form of the head, the surplus metal being thereby forced into the shank, as set forth.

MACHINE FOR BACKING BOOKS.—Simeon M. Elder, Portland, Me., administrator of John A. Elder, deceased, Westbrook, Me. Letters patent No. 9,886, dated July 25, 1853.

1st, I claim hanging the frame, carrying the pressure roller, K, upon, and eccentrically to the center of motion of the arms, F, so that the center of motion of the frame can be raised at pleasure, in the manner and for the purposes described.

2d, The combination of the wedge, M, and bars, W and V, when connected with the jaws of the clamps as described, for the purpose of keeping the center of the book, whatever its thickness, vertical with the bearings, G, of the swedging frame, W, as described and set forth.

MACHINE FOR TURNING IRREGULAR FORMS.—Lauren Ward, administrator of Richard Ward, deceased, Naugatuck, Conn. Letters patent No. 9,822. Dated June 28, 1853.

I claim the combination of the jointed levers, n and n, suspended by their upper ends with the crank, j, and connecting rod, k, when so constructed and arranged as to elevate or depress the inner part, O O, of the carriage, and the toothed cutter, c, in such a manner as to give a regular elliptical form to the polygon where the opposite longitudinal sections will be equal, and similar when the whole is constructed, arranged and combined substantially as herein described.

I also claim the use of the notched collet, d, on the toothed center, c, and the curved bar, Y, in combination with the jointed levers, n and n, to give regular and irregular forms to different parts of the same elliptic polygon, when the whole is constructed and combined, substantially as herein described.

MODE OF DRIVING RECIPROCATING SAWS.—Isaac Brown, Cecilton, Md. Letters patent, No. 9,855. Dated July 19, 1853. Reissue No. 425. Dated Feb. 3, 1857.

I claim the mode herein described for applying the power of the engine to the saw gate or frame, without being permanently connected therewith so that the piston shall be in a great measure relieved from any lateral motion, which the gate may have, which causes it to bind or cut in the cylinder substantially as described.

I also claim driving one or more saws between two cylinders as well as driving one or more saws on each side of a single cylinder, and the self adjusting piston rod or the self-adjustable slides which accomplish the same result as are herein before described.

ANTI-FRICTION BOX.—Geo. Y. Perry, (assignor to John Rice,) Philadelphia, Pa. Letters patent, No. 9,912. Dated Aug. 2, 1853.

I claim making the rollers in the form of double frustra reversed, and united at their bases and traveling in circular grooves of nearly corresponding form of the surface between which the rollers are interposed substantially in the manner and for the purpose herein specified.

MACHINE FOR FORMING BUTTON BACKS AND CONNECTING THE EYES THERETO.—Jay C. Cook, Middletown, Conn., assignor through mesne assignment to the City Manufacturing Co., &c., Waterbury, Conn. Letters patent, No. 9,146, dated July 27th, 1852. Reissue No. 1,446, dated April 7th, 1863.

I claim, 1st, the jointed clamps, i, i, (fig. 2,) and the tongue, n, (figs. 1, 3,) to form the eye, when combined with the slide, L, with its stationary and movable jaw, a and b, the movable jaw and slide being worked by a jointed lever, c, c', to feed the wire, the whole constructed and operated substantially as described.

2d, The die for punching and forming the button back, composed of the punch, S, and bed, Q, when combined with the slide, p, p, and feeding cylinder, F, when constructed and operated substantially as described.

3d, The jointed fingers, u u, for receiving the button back when formed and punched, and conveying it to and placing it on the eye, when combined with the setting and riveting punch, U, when arranged, combined and operated, substantially as described.

4th, Holding the eye of the button in the mechanism that forms the eye until and while the back is placed upon and fastened to it.

EYES FOR MILL STONES.—Edmund Munson, Utica, N. Y. Letters patent, No. 9,859. dated July 19, 1853.

I claim the spiral wings, arranged in such manner as to perform the double office of feeding the grain and supporting the stone.

SOCKET FOR AUGUR HANDLES AND BRACES.—Asahel H. McKinsley, Higginsport, Ohio. Letters patent No. 9,989, dated Aug. 16, 1853.

I claim the peculiar arrangement of mechanism by which I enable the supplying and unshipping of the bit and handle of an auger or other boring tool, that is to say the socket having a circular head and vibrating cap, whose aperture can be made at one position to coincide with the mouth of the socket and in the other position to oppose its straight edges to the projecting corners of the shank, the cap being retained in the desired position by spring and notch as described, or its equivalent.

SUBMARINE TUNNELS.—William Miller, (administrator of Jos. R. Miller, deceased,) Pensacola, Fla. Letters patent No. 9,899, dated Aug. 2, 1853. Reissue No. 2,504, dated March 12, 1867. Reissued to the American Submarine Tunnel Co., New York City.

I claim the construction, arrangement and formation of submarine and subterranean avenues, by means of cast iron sections united together by flanges and bolts, in the manner and for the purpose herein described.

APPARATUS FOR GRINDING AND SHARPENING METALS.—Samuel Darling, Bangor, Me. Letters patent No. 9,976, dated Aug. 30, 1853.

I claim the combination of the holder of the article to be ground with a grindstone or grinding disk, substantially in the manner herein set forth, so that the article and the stone will change positions relatively to each other during the operation in three directions, namely, towards each other, and parallel with, and transversely to the axis of the stone.

PULP FROM WOOD, &C., FOR THE MANUFACTURE OF PAPER. Chas. Watt and Hugh Burgess, London, Eng., assignors to Wm. F. Ladd, New York City, and M. L. Keen, Philadelphia, Pa. Letters patent No, 11,343, dated July 18, 1854. Antedated Aug. 19, 1853. Reissue No. 608, dated Oct. 5, 1858; again in two divisions. Reissue No. 1,448, dated April 7, 1863.

We claim a pulp suitable for the manufacture of paper, made from wood or other vegetable substances by boiling the wood or other vegetable substance in an alkali under pressure, substantially as described.

PROCESS OF TREATING WOOD AND OTHER VEGETABLE SUBSTANCES, IN THE MANUFACTURE OF PAPER PULP.—Chas. Watt & Hugh Burgess, London, Eng., assignors to Wm. T. Ladd, New York city, and M. L. Keen, Philadelphia, Pa. Letters Patent, No. 11,343, dated July 18, 1854. Antedated Aug. 19, 1853. Reissue, No. 608, dated Oct. 5, 1863; again, in two divisions. Reissue, No. 1,449; dated April 7, 1863.

We claim, 1st, The process of treating wood or other vegetable substance, by boiling in an alkali under pressure, as a process, or preparatory process for making pulp for the manufacture of paper from such woods or other vegetable substances, substantially as described.

2d, We also claim the process of treating resinous woods by boiling in an alkali under pressure, and treating the product with chlorine, and its compounds with oxygen, for making white pulp for the manufacture of paper from such substances as described.

CIDER MILL.—John Krauser, Tylersburgh, Pa.—Letters Patent, No. 9,972. Dated Aug. 30, 1853.

I claim, 1st, So arranging the hopper with reference to several operating parts of the machine, that the fruit or other substances contained therein shall not rest directly upon or against the roughened exterior of the grinding cylinder; but directly upon so much of the upper surface of the anterior ends of the pistons or plungers, as shall be found operating or exposed within its inclosed sides, for the purpose of agitating the incumbent substance so as to insure and facilitate the filling of the cells, as the pistons recede from the cylinder; and in the second place, which is a consequence of the first, viz., to cause the incumbent substance to press upon the cumbent, or that contained within the cells, so as to oppose the upheaving or ejectment of the same while in the act of being pressed against the passing teeth of the revolving cylinder, c, by the action of the alternating pistons or plungers, as herein more fully described and set forth.

NOTE.—SIXTY-FIVE patents in the above list were procured through the agency of the SCIENTIFIC AMERICAN.—*Eds.*

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

64,734.—IMPROVEMENT IN EYELETING MACHINE.—William N. Ely, Stratford, Conn., assignee by mesne assignments of N. Ames and J. E. Gowen. Dated May 14th, 1867. Application for reissue received and filed August 27, 1867. Div. B.

I claim, 1st, the adoption and use of a common receptacle or hopper, for holding the eyelets when promiscuously thrown in, and supplied with a means of reaching the heading mechanism substantially as described.

2d, Agitating the eyelets so as to present them in proper position to the eyelet feeding mechanism substantially as described.

3d, A promiscuous eyelet holding hopper, an eyelet feeding mechanism, when combined and operating substantially as described.

4th, In combination with the above, a work supporting table, substantially as described,

5th, The combination of eyelet hopper, holding pin and header, substantially as described.

6th, The combination of eyelet hopper, heading mechanism, and work feeding device, substantially as described.

64,734.—EYELETING MACHINE.—William N. Ely, Stratford, Conn., assignee by mesne assignments of N, Ames and J. E. Gowen. Dated May 14, 1867. Application for reissue received and filed Aug. 27, 1867. Div. C.

I claim, 1st, A reciprocating puncher, constructed, arranged, and automatically operated, substantially as described.

2d, A reciprocating punching table, constructed and arranged so as to be alternately removed and replaced, substantially as described.

3d, The reciprocating puncher, in combination with the movable punching table, substantially as described.

5th, The combination of puncher, work holding table, and work feeding device, substantially as described.

6th, The combination of a puncher and guage, for the line of holes, substantially as described.

67,734.—EYELETING MACHINE.—William N. Ely, Stratford, Conn., assignee by mesne assignments of N. Ames and J. E. Gowen, Dated May 14. 1867. Application for reissue received and filed Aug. 27, 1867. Div. D.

I claim, 1st, the combination of a puncher and header, constructed and arranged so as to be automatically operated for punching the holes and heading the eyelets substantially as described,

2, The combination of a puncher and header with a movable punching table, substantially as described.

3, The combination of a work-supporting table with an automatically reciprocating puncher and header, arranged and operating substantially as described.

4th, The combination of puncher, header, work-supporting table and work-feeding device, substantially as described.

5th, The combination of a punching and heading mechanism with an eyelet holding hopper, substantially as described.

6th, The combination and arrangements of parts by which punching the holes, furnishing, inserting and heading the eyelets is automatically accomplished, substantially as described.

64,734.—EYELETING MACHINE.—William N. Ely, Stratford, Conn., assignee by mesne assignments of N. Ames and J. E. Gowen, Dated May 14, 1867. Application for reissue received and filed Aug. 27, 1867. Div. E.

I claim, 1st, A puncher and header operating reciprocally when combined, arranged and operating so as to strike alternately on or over the same fixed point, substantially as described.

2d, A reciprocating heading seat in combination with the puncher and header, when arranged and operating at the same fixed point, substantially as described.

3d, A laterally-reciprocating punching table in combination with the puncher, header and heading seat, all arranged and operating at the same fixed point, substantially as described.

4th, The reciprocating punching table and heading seat so combined, arranged and operating as to alternately occupy the same place for punching holes and threading eyelets at the same point, substantially as described.

5th, Supplying the eyelets from a common hopper to the heading seat or holding point by a belt and groove, substantially as described.

6th, The work-feeding device, constructed and arranged with an eyeleting machine, substantially as described.

7th, The adjustable gage in combination with the holding table for regulating the line of eyelets, substantially as described.

8th, Punching the holes, furnishing, inserting and heading the eyelets at the same fixed point automatically, substantially by the means and in the manner described.

64,734.—EYELETING MACHINE.—William N. Ely, Stratford, Conn., assignee by mesne assignments of N. Ames and J. E. Gowen. Dated May 14, 1867. Application for reissue received and filed Aug. 27, 1867. Div. F.

I claim, 1st, The combination of rod, J, and lever, I, arranged and operating substantially as described.

2d, The combination of rods, J and K, arranged and operating substantially as described.

3d, The combination of rods, J and K, and lever, I, arranged and operating as described.

4th The combination of rods, J and K, spring, I', and lever, I, arranged and operating substantially as described.

5th. The combination of rods, J and K, lever, I, and header, C, arranged and operating substantially as described.

6th, The combination of header, C, lever, C', and pitman, F', substantially as described.

7th, The combination of hopper, N, rods, J and K, and header, C, substantially as described.

8th. The combination of punches, B, lever, B', pitman, G', substantially as described.

9th, The combination of puncher, B, and sliding plate, U, substantially as described.

10th, The combination of plate, U, and levers, V and I, substantially as described.

11th, The combination of puncher, B, header, C, sliding plate, U, and rods, J and K, substantially as described.

12, The combination of puncher, B, header, C, plate, U, rods, J and K, hopper, N, belt, R, and groove, X, substantially as described.

13th, The combination of table, U, and pawl, Y, substantially as described.

14th, The combination of table, U, and guide, W, substantially as described.

15th, The combination of puncher, B, or header, C, with pawl, Y, or guide, W, substantially as described.

16th, The combination of hopper, N, with bristles or flexible arms, O, substantially as described.

49,647.—WALL BUILDER AND STUMP EXTRACTOR.—George W. Packer, Jr., Mystic River, Conn. Dated Aug. 29, 1865. Application for reissue received and filed Aug. 21, 1867.

1st, I claim the within-described mode of laying masses in a wall, or equivalent work, that is to say, partially turning the vehicle so as to bring the mass over the point desired, without moving the wheels across the same, substantially as herein specified.

2d, I claim the within-described combination and arrangement of the pyramidal frame, M M1 M2, and curved reaches, E1 E2, with the four wheels and their accessories, substantially as and for the purposes set forth.

3d, I claim the employment of braces, P1 P2, or their equivalents, in combination with the struts, M, etc., and the curved reaches, P, etc., and arranged to be supported on wheels, substantially in the manner described so that the braces shall aid in maintaining the curvature or arching condition of the reaches by connecting each to the struts above at one or more points, as and for the purpose herein set forth.

4th, I claim the spherical based rocker, having the king bolt, D, connected thereto by a loose joint as represented in combination with a trussed frame, M etc., and with the wheels, substantially as and for the purposes herein set forth.

66,430.—PITMAN CONNECTION FOR HARVESTER.—Hiram L. Wanzer, New York City Dated July 2, 1867. Application for reissue received and filed August 23, 1867.

I claim, 1st, connecting the pitman, B, to the pitman wheel, A, of a harvester, by means of a round or polygonal pin, a, having an eccentric projection, d, and made and operating substantially as and for the purpose herein shown and described.

2d, The tapering pin, a, when arranged in combination with the washer, e, and nut, b, all made and operating substantially as and for the purpose herein shown and described.

3d, I claim the pin, i, in combination with the packing, k, all made and operating substantially as and for the purpose herein shown and described.

57,125.—PULLEY ATTACHMENT FOR RAISING WEIGHTS.—George W. Gregory, Watertown, N. Y. Dated August 14, 1866. Antedated February 14, 1866. Application for reissue received and filed August 27, 1867.

1st, I claim an adjustable pulley support having one or more sockets or eyes, or their equivalents, by which the pulley can be attached to the pulley support, and the pulley support changed from place to place, for the purpose set forth.

2d, An adjustable pulley support, having one or more sockets, or their equivalents, by and through which the pulley support may be operated and changed from place to place, for the purpose set forth.

3d, An adjustable pulley support, provided with means for changing the same from place to place, and with means for supporting the pulley.

64,734.—EYELETING MACHINE.—William N. Ely, Stratford, Ct., assignee by mesne assignments of N. Ames and J. E. Gowen. Dated May 14, 1867. Application for reissue received and filed August 27, 1867. Division A.

I claim, 1st, A reciprocating heading seat, constructed, arranged, and operated, substantially as described.

2d, A reciprocating piston, or holding pin, in combination with the heading seat, when constructed, arranged, and operated, substantially as described.

3d, A spring piston rest, in combination with the reciprocating heading seat, and holding point, substantially as described.

4th, The reciprocating heading seat and piston, in combination with a vertical header, substantially as described.

5th, A reciprocating heading seat, in combination with a header, and work-supporting table, substantially as described.

6th, A heading seat, header, and work supporting table, in combination with a work-feeding device, substantially as described.

7th, A reciprocating header, constructed, arranged, and automatically operated, substantially as described

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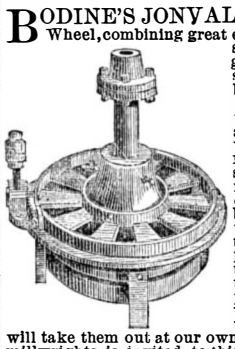

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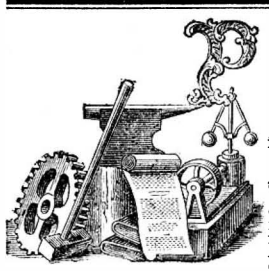

PATENTS

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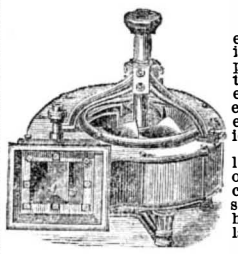

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